V. I. LENIN

MATERIALISM
AND
EMPIRIO-CRITICISM

CRITICAL COMMENTS ON
A REACTIONARY PHILOSOPHY

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PREFACE TO THE FIRST EDITION

A number of writers, would-be Marxists, have this year undertaken a veritable campaign against the philosophy of Marxism. In the course of less than half a year four books devoted mainly and almost exclusively to attacks on dialectical materialism have made their appearance. These include first and foremost *Studies in* (?—it would have been more proper to say "against") *the Philosophy of Marxism* (St. Petersburg, 1908), a symposium by Bazarov, Bogdanov, Lunacharsky, Berman, Helfond, Yushkevich and Suvorov; Yushkevich's *Materialism and Critical Realism;* Berman's *Dialectics in the Light of the Modern Theory of Knowledge* and Valentinov's *The Philosophical Constructions of Marxism.*

All these people could not have been ignorant of the fact that Marx and Engels scores of times termed their philosophical views dialectical materialism. Yet all these people, who, despite the sharp divergence of their political views, are united in their hostility toward dialectical materialism, at the same time claim to be Marxists in philosophy! Engels' dialectics is "mysticism," says Berman. Engels' views have become "antiquated," remarks Bazarov casually, as though it were a self-evident fact. Materialism thus appears to be refuted by our bold warriors, who proudly allude to the "modern theory of knowledge," "recent philosophy" (or "recent positivism"), the "philosophy of modern natural science," or even the "philosophy of natural science of the twentieth century." Supported by all these supposedly recent doctrines, our destroyers of dialectical materialism proceed fearlessly to downright fideism[1] (in the case of Lunacharsky it is most evident, but by no means in his case alone!). Yet when it comes to an explicit definition of their attitude towards Marx and Engels, all their courage and all their respect for their own convictions at once disappear. In deed—a complete renunciation of dialectical materialism, *i.e.*, of Marxism; in word—endless subterfuges, attempts to evade the essence of the question, to cover their retreat, to put some materialist or other in place of materialism in general, and a determined refusal to make a direct analysis of the innumerable materialist declarations of Marx and Engels. This is truly "mutiny on one's knees," as it was justly characterised by one Marxist. This is typical philosophical revisionism, for it was only the revisionists who gained a sad notoriety for themselves by their departure from the fundamental views of Marxism and by their fear, or inability, to "settle accounts" openly, explicitly, resolutely and clearly with the views they had abandoned. When orthodox Marxists had occasion to pronounce against some antiquated views of Marx (for instance, Mehring when he opposed certain historical propositions), it was always done with such precision and thoroughness that no one has ever found anything ambiguous in such literary utterances.

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[1] *Fideism* is a doctrine which substitutes faith for knowledge, or which generally attaches significance to faith.

For the rest, there is in the *Studies "in" the Philosophy of Marxism* one phrase which resembles the truth. This is Lunacharsky's phrase: "Perhaps we [*i.e.*, all the collaborators of the *Studies* evidently] have gone astray, but we are seeking" (p. 161). That the first half of this phrase contains an absolute and the second a relative truth, I shall endeavour to demonstrate circumstantially in the present book. At the moment I would only remark that if our philosophers had spoken not in the name of Marxism but in the name of a few "seeking" Marxists, they would have shown more respect for themselves and for Marxism.

As for myself, I too am a "seeker" in philosophy. Namely, the task I have set myself in these comments is to find out what was the stumbling block to these people who under the guise of Marxism are offering something incredibly muddled, confused and reactionary.

September 1908 ***The Author***

PREFACE TO THE SECOND EDITION

With the exception of a few corrections in the text, the present edition does not differ from the previous one. I hope that, irrespective of the dispute with the Russian "Machians," it will prove useful as an aid to an acquaintance with the philosophy of Marxism, dialectical materialism, as well as with the philosophical conclusions from the recent discoveries in natural science. As for A. A. Bogdanov's latest works, which I have had no opportunity to examine, the appended article by Comrade V. I. Nevsky gives the necessary information.[1] Comrade V. I. Nevsky, not only in his work as a propagandist in general, but also as an active worker in the Party school in particular, has had ample opportunity to convince himself that under the guise of "proletarian culture" A. A. Bogdanov is imparting bourgeois and reactionary views.

September 2, 1920

N. Lenin

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[1] This article is omitted from the present edition.—*Trans.*

IN LIEU OF INTRODUCTION

HOW CERTAIN "MARXISTS" IN 1908 AND CERTAIN IDEALISTS IN 1710 REFUTED MATERIALISM

Anyone in the least acquainted with philosophical literature must know that scarcely a single contemporary professor of philosophy (or of theology) can be found who is not directly or indirectly engaged in refuting materialism. They have declared materialism refuted a thousand times, yet are continuing to refute it for the thousand and first time. All our revisionists are engaged in refuting materialism, pretending, however, that actually they are only refuting the materialist Plekhanov, and not the materialist Engels, nor the materialist Feuerbach, nor the materialist views of J. Dietzgen—and, moreover, that they are refuting materialism from the standpoint of "recent" and "modern" positivism, natural science, and so forth. Without citing quotations, which anyone desiring to do so could cull by the hundred from the books above mentioned, I shall refer to those arguments by which materialism is being combated by Bazarov, Bogdanov, Yushkevich, Valentinov, Chernov[1] and other Machians. I shall use this latter term throughout as a synonym for "empirio-criticist" because it is shorter and simpler and has already acquired rights of citizenship in Russian literature. That Ernst Mach is the most popular representative of empirio-criticism today is universally acknowledged in philosophical literature,[2] while Bogdanov's and Yushkevich's departures from "pure" Machism are of absolutely secondary importance, as will be shown later.

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[1] V. Chernov, *Philosophical and Sociological Studies*, Moscow, 1907. The author is as ardent an adherent of Avenarius and an enemy of dialectical materialism as Bazarov and Co.

[2] See, for instance, Dr. Richard Hönigswald, *Ueber die Lehre Humes von der Realität der Außendinge*, Berlin, 1904, S. 26.

The materialists, we are told, recognise something unthinkable and unknowable—"things-in-themselves"—matter "outside of experience" and outside of our knowledge. They lapse into genuine mysticism by admitting the existence of something beyond, something transcending the bounds of "experience" and knowledge. When they say that matter, by acting upon our sense-organs, produces sensations, the materialists take as their basis the "unknown," nothingness; for do they not themselves declare our sensations to be the only source of knowledge? The materialists lapse into "Kantianism" (Plekhanov, by recognising the existence of "things-in-themselves," *i.e.*, things outside of our consciousness); they "duplicate" the world and preach "dualism," for the materialists hold that beyond the appearance there is the thing-in-itself; beyond the immediate sense data there is something else, some fetish, an "idol," an absolute, a source of "metaphysics," a double of religion ("holy matter," as Bazarov says).

Such are the arguments levelled by the Machians against materialism, as repeated and retold in varying keys by the afore-mentioned writers.

In order to test whether these arguments are new, and whether they are really directed against only one Russian materialist who "lapsed into Kantianism," we shall give some detailed quotations from the works of an old idealist, George Berkeley. This historical inquiry is all the more necessary in the introduction to our comments since we shall have frequent occasion to refer to Berkeley and his trend in philosophy, for the Machians misrepresent both the relation of Mach to Berkeley and the essence of Berkeley's philosophical line.

The work of Bishop George Berkeley, published in 1710 under the title *Treatise Concerning the Principles of Human Knowledge*[1] begins with the following argument: "It is evident to anyone who takes a survey of the *objects* of human knowledge, that they are either ideas actually imprinted on the senses; or else such as are perceived by attending to the passions and operations of the mind; or lastly, ideas formed by help of memory and imagination.... By sight I have the ideas of light and colours, with their several degrees and variations. By touch I perceive hard and soft, heat and cold, motion and resistance.... Smelling furnishes me with odours; the palate with tastes; and hearing conveys sounds.... And as several of these are observed to accompany each other, they come to be marked by one name, and so to be reputed as one thing. Thus, for example, a certain colour, taste, smell, figure and consistence having been observed to go together, are accounted one distinct thing, signified by the name apple; other collections of ideas constitute a stone, a tree, a book, and the like sensible things..." (§ 1).

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[1] *Works of George Berkeley*, edited by A. C. Fraser, Oxford, 1871, Vol. I, p. 155.

Such is the content of the first section of Berkeley's work. We must remember that Berkeley takes as the basis of his philosophy "hard, soft, heat, cold, colours, taste, odours," etc. For Berkeley, things are "collections of ideas," this expression designating the aforesaid, let us say, qualities or sensations, and not abstract thoughts.

Berkeley goes on to say that besides these "ideas or objects of knowledge" there exists something that perceives them—"mind, spirit, soul or *myself*" (§ 2). It is self-evident, the philosopher concludes, that "ideas" cannot exist outside of the mind that perceives them. In order to convince ourselves of this it is enough to consider the meaning of the word "exist." "The table I write on I say exists, that is, I see and feel it; and if I were out of my study I should say it existed; meaning thereby that if I was in my study I might perceive it...." That is what Berkeley says in § 3 of his work and thereupon he begins a polemic against the people whom he calls materialists (§§ 18, 19, etc.). "I cannot conceive," he says, "how it is possible to speak of the absolute existence of things without their relation to the fact that somebody perceives them. To exist means to be perceived" (their *esse* is *percipi,* § 3—a dictum of Berkeley's frequently quoted in textbooks on the history of philosophy). "It is indeed an opinion strangely prevailing amongst men, that houses, mountains, rivers, and in a word all sensible objects have an existence, natural or real, distinct from their being perceived by the understanding" (§ 4). This opinion is a "manifest contradiction," says Berkeley. "For, what are the afore-mentioned objects but the things we perceive by sense? and what do we perceive besides our own ideas or sensations? and is it not plainly repugnant that any one of these, or any combination of them, should exist unperceived?" (§ 4.)

The expression "collection of ideas" Berkeley now replaces by what to him is an equivalent expression, *combination of sensations*, and accuses the materialists of a "repugnant" tendency to go still further, of seeking some source of this complex—that is, of this combination of sensations. In § 5 the materialists are accused of trifling with an abstraction, for to divorce the sensation from the object, according to Berkeley, is an empty abstraction. "In truth," he says at the end of § 5, omitted in the second edition, "the object and the sensation are the same thing, and cannot therefore be abstracted from each other." Berkeley goes on: "But, say you, though the ideas themselves do not exist without the mind, yet there may be things like them, whereof they are copies or resemblances; which things exist without the mind, in an unthinking substance. I answer, an idea can be like nothing but an idea; a colour or figure can be like nothing but another colour or figure.... I ask whether those supposed originals, or external things, of which our ideas are the pictures or representations, be themselves perceivable or no? If they are, then they are ideas and we have gained our point; but if you say they are not, I appeal to anyone whether it be sense to assert a colour is like something which is invisible; hard or soft, like something which is intangible; and so of the rest" (§ 8).

As the reader sees, Bazarov's "arguments" against Plekhanov concerning the problem of whether things can exist apart from their action on us do not differ in the least from Berkeley's arguments against the materialists whom he does not mention by name. Berkeley considers the notion of the existence of "matter or corporeal substance" (§ 9) such a "contradiction," such a "repugnant" thing that it is really not worth wasting time exposing it. He says: "But because the tenet of the existence of Matter seems to have taken so deep a root in the minds of philosophers, and draws after it so many ill consequences, I choose rather to be thought prolix and tedious than omit anything that might conduce to the full discovery and extirpation of that prejudice" (§ 9).

We shall presently see to what ill consequences Berkeley is referring. Let us first finish with his theoretical arguments against the materialists. Denying the "absolute" existence of objects, that is, the existence of things outside human knowledge, Berkeley deliberately represents the views of his opponents as though they recognised the "thing-in-itself." In § 24 Berkeley writes in italics that the opinion which he is refuting recognises *"the absolute existence of sensible objects in themselves, or without the mind"* (pp. 167-68, *op. cit.*). The two fundamental lines of philosophical outlook are here depicted with the straightforwardness, clarity and precision that distinguish the classical philosophers from the inventors of "new" systems in our day. Materialism is the recognition of "objects in themselves," or outside the mind; ideas and sensations are copies or images of those objects. The opposite doctrine (idealism) claims that objects do not exist "without the mind"; objects are "combinations of sensations."

This was written in 1710, fourteen years before the birth of Immanuel Kant, yet our Machians, supposedly on the basis of "recent" philosophy, made the discovery that the recognition of "objects in themselves" is a result of the infection or distortion of materialism by Kantianism! The "new" discoveries of the Machians are the product of an astounding ignorance of the history of the basic philosophical trends.

Their next "new" thought consists in this: that the concepts "matter" or "substance" are remnants of old uncritical views. Mach and Avenarius, you see, advanced philosophical thought, deepened analysis and eliminated these "absolutes," "unchangeable entities," etc. If you wish to check such assertions with the original sources, go to Berkeley and you will see that they are pretentious fictions. Berkeley says quite definitely that matter is "nonentity" (§ 68), that matter is *nothing* (§ 80). "You may," thus Berkeley ridicules the materialists, "if so it shall seem good, use the word *matter* in the same sense as other men use *nothing*" (pp. 196-97). At the beginning, says Berkeley, it was believed that colours, odours, etc., "really exist," but subsequently such views were renounced, and it was seen that they only exist in dependence on our sensations. But this elimination of old erroneous concepts was not completed; a remnant is the concept "substance" (§ 73), which is also a "prejudice" (p. 195), and which was finally exposed by Bishop Berkeley in 1710! In 1908 there are still wags who seriously believe Avenarius, Petzoldt, Mach and the rest, when they maintain that it was only "recent positivism" and "recent natural science" which at last succeeded in eliminating these "metaphysical" conceptions.

These same wags (among them Bogdanov) assure their readers that it was the new philosophy that explained the error of the "duplication of the world" in the doctrine of the eternally refuted materialists, who speak of some sort of a "reflection" by the human consciousness of things existing outside the consciousness. A mass of sentimental verbiage has been written by the above-named authors about this "duplication." Owing to forgetfulness or ignorance, they failed to add that these new discoveries had already been discovered in 1710. Berkeley says:

"Our knowledge of these [*i.e.,* ideas or things] has been very much obscured and confounded, and we have been led into very dangerous errors by supposing a twofold existence of the objects of sense—the one *intelligible* or in the mind, the other *real* and without the mind" (*i.e.,* outside consciousness). And Berkeley ridicules this "repugnant" notion, which admits the possibility of thinking the unthinkable! The source of the "repugnancy," of course, follows from our supposing a difference between *things* and *ideas* ... the supposition of external objects" (§ 87). This same source—as discovered by Berkeley in 1710 and rediscovered by Bogdanov in 1908—engenders a faith in fetishes and idols. "The existence of Matter," says Berkeley, "or bodies unperceived, has not only been the main support of Atheists and Fatalists, but on the same principle doth Idolatry likewise in all its various forms depend" (§ 94).

Here we arrive at those "ill consequences" derived from the "repugnant" doctrine of the existence of an external world which compelled Bishop Berkeley not only to refute this doctrine theoretically, but passionately to persecute its adherents as enemies. "For as we have shown the doctrine of Matter or corporeal Substance to have been the main pillar and support of Scepticism, so likewise upon the same foundation have been raised all the impious schemes of Atheism and Irreligion.... How great a friend material substance has been to Atheists in all ages were needless to relate. All their monstrous systems have so visible and necessary a dependence on it, that when this cornerstone is once removed, the whole fabric cannot choose but fall to the ground, insomuch that it is no longer worth while to bestow a particular consideration on the absurdities of every wretched sect of Atheists (§ 92, p. 203).

"Matter being once expelled out of nature drags with it so many sceptical and impious notions, such an incredible number of disputes and puzzling questions ["the principle of economy of thought," discovered by Mach in the 'seventies, "philosophy as a conception of the world according to the principle of minimum expenditure of effort"—Avenarius in 1876!] which have been thorns in the sides of divines as well as philosophers, and made so much fruitless work for mankind, that if the arguments we have produced against it are not found equal to demonstration (as to me they evidently seem), yet I am sure all friends to knowledge, peace, and religion have reason to wish they were" (§ 96).

Frankly and bluntly did Bishop Berkeley argue! In our time these very same thoughts on the "economical" elimination of "matter" from philosophy are enveloped in a much more artful form, and confused by the use of a "new" terminology, so that these thoughts may be taken by naïve people for "recent" philosophy!

But Berkeley was not only candid as to the tendencies of his philosophy, he also endeavoured to cover its idealistic nakedness, to represent it as being free from absurdities and acceptable to "common sense." Instinctively defending himself against the accusation of what would nowadays be called subjective idealism and solipsism, he says that by our philosophy "we are not deprived of any one thing in nature" (§ 34). Nature remains, and the distinction between realities and chimeras remains, only "they both equally exist in the mind." "I do not argue against the existence of any one thing that we can apprehend, either by sense or reflection. That the things I see with my eyes and touch with my hands do exist, really exist, I make not the least question. The only thing whose existence we deny is that which *philosophers* [Berkeley's italics] call Matter or corporeal substance. And in doing this there is no damage done to the rest of mankind, who, I dare say, will never miss it. . . . The Atheist indeed will want the colour of an empty name to support his impiety. . . ."

This thought is made still clearer in § 37, where Berkeley replies to the charge that his philosophy destroys corporeal substance: ". . . if the word *substance* be taken in the vulgar sense, for a *combination* of sensible qualities, such as extension, solidity, weight, and the like—this we cannot be accused of taking away; but if it be taken in a philosophic sense, for the support of accidents or qualities without the mind—then indeed I acknowledge that we take it away, if one may be said to take away that which never had any existence, not even in the imagination."

Not without good cause did the English philosopher, Fraser, an idealist and adherent of Berkeleianism, who edited

Berkeley's works and supplied them with his own annotations, designate Berkeley's doctrine by the term "natural realism" (*op. cit.*, p. x). This amusing terminology must by all means be noted, for it in fact expresses Berkeley's intention to counterfeit realism. In our further exposition we shall frequently find the "recent" "positivists" repeating the same stratagem or counterfeit in a different form and in a different verbal wrapping. Berkeley does not deny the existence of real things! Berkeley does not go counter to the opinion of all humanity! Berkeley denies "only" the teaching of the philosophers, *viz.*, the theory of knowledge, which seriously and resolutely takes as the foundation of all its reasoning the recognition of the external world and the reflection thereof in the minds of men. Berkeley does not deny natural science, which has always adhered (mostly unconsciously) to this, *i.e.*, the materialist, theory of knowledge. We read in § 59: "We may, from the experience[1] [Berkeley—a philosophy of "pure experience"] we have had of the train and succession of ideas in our minds ... make ... well-grounded predictions concerning the ideas we shall be affected with pursuant to a great train of actions, and be enabled to pass a right judgment of what would have appeared to us, in case we were placed in circumstances very different from those we are in at present. Herein consists the knowledge of nature, which [listen to this!] may preserve its use and certainty very consistently with what hath been said."

Let us regard the external world, nature, as "a combination of sensations" evoked in our mind by a deity. Acknowledge this and give up searching for the "ground" of these sensations outside the mind, outside men, and I will acknowledge within the framework of my idealist theory of knowledge *all* natural science and all the importance and authenticity of its deductions. It is precisely this framework, and only this framework, that I need for my deductions in favour of "peace and religion." Such is Berkeley's train of thought. It correctly expresses the essence of idealist philosophy and its social significance, and we shall encounter it later when we come to speak of the relation of Machism to natural science.

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[1] In his preface Fraser insists that both Berkeley and Locke "appeal exclusively to experience" (p. 117).

Let us now consider another recent discovery that was borrowed from Bishop Berkeley in the twentieth century by the recent positivist and critical realist, P. Yushkevich. This discovery is "empirio-symbolism." "Berkeley," says Fraser, "thus reverts to his favourite theory of a Universal Natural Symbolism" (*op. cit.,* p. 190). Did these words not occur in an edition of 1871, one might have suspected the English fideist philosopher Fraser of plagiarising both the modern mathematician and physicist Poincaré and the Russian "Marxist" Yushkevich!

This theory of Berkeley's which threw Fraser into raptures, is set forth by the Bishop as follows:

"The connexion of ideas [do not forget that for Berkeley ideas and things are identical] does not imply the relation of *cause* and *effect,* but only of a mark or *sign* with the thing *signified"* (§ 65). "Hence, it is evident that those things, which under the notion of a cause co-operating or concurring to the production of effects, are altogether inexplicable, and run us into great absurdities, may be very naturally explained ... when they are considered only as marks or signs for our information" (§ 66). Of course, in the opinion of Berkeley and Fraser, it is no other than the deity who informs us by means of these "empirio-symbols." The epistemological significance of *symbolism* in Berkeley's theory, however, consists in this, that it is to replace "the doctrine" which "pretends to explain things by corporeal causes" (§ 66).

We have before us two philosophical trends in the question of causality. One "pretends to explain things by corporeal causes." It is clear that it is connected with the "doctrine of matter" refuted as "repugnant" by Bishop Berkeley. The other reduces the "notion of causality" to the notion of a "mark or sign" which serves for "our information" (supplied by God). We shall meet these two trends in a twentieth-century garb when we analyse the attitudes of Machism and dialectical materialism to this question.

Further, as regards the question of reality, it ought also to be remarked that Berkeley, refusing as he does to recognise the existence of things outside the mind, tries to find a criterion for distinguishing between the real and the fictitious. In § 36 he says that those "ideas" which the minds of men evoke at pleasure "are faint, weak, and unsteady in respect to others they perceive by sense; which, being impressed upon them according to certain rules or laws of nature, speak themselves about the effects of a Mind more powerful and wise than human spirits. These latter are said to have *more reality* in them than the former; by which is meant that they are more affecting, orderly and distinct, and that they are not fictions of the mind perceiving them...." Elsewhere (§ 84) Berkeley tries to connect the notion of reality with the simultaneous perception of the same sensations by many people. For instance, how shall we resolve the question as to whether the transformation of water into wine, of which we are being told, is real? "If at table all who were present should see, and smell, and taste, and drink wine, and find the effects of it, with me there could be no doubt of its reality." And Fraser explains: "The simultaneous consciousness of ... the 'same' *sense*-ideas by different persons, as distinguished from the purely individual or personal consciousness of *imaginary* objects and emotions, is here referred to as a test of the *reality* of the former."

From this it is evident that Berkeley's subjective idealism is not to be interpreted as though it ignored the distinction between individual and collective perception. On the contrary, he attempts on the basis of this distinction to construct a criterion of reality. Deriving "ideas" from the action of the deity upon the human mind, Berkeley thus approaches objective idealism: the world proves to be not my idea but the product of a single supreme spiritual cause that creates both the "laws of nature" and the laws distinguishing "more real" ideas from those less real, and so forth.

In another work, *The Three Dialogues Between Hylas and Philonous* (1713), where he endeavours to present his views in an especially popular form, Berkeley sets forth the opposition between his doctrine and the materialist doctrine in the following way:

"I assert as well as you [materialists] that, since we are affected from without, we must allow Powers to be without, in a Being distinct from ourselves.... But then we differ as to the kind of this powerful being. I will have it to be Spirit, you Matter, or I know not what (I may add too, you know not what) third nature..." (p. 335).

Fraser comments: "This is the gist of the whole question. According to the Materialists, sensible phenomena are due to *material substance,* or to some unknown 'third nature'; according to Berkeley, to Rational Will; according to Hume and the Positivists, their origin is absolutely unknown, and we can only generalise them inductively, through custom, as facts."

Here the English Berkeleian, Fraser, approaches from his consistent idealist standpoint the same fundamental "lines" in philosophy which were so clearly characterised by the materialist Engels. In his work *Ludwig Feuerbach* Engels divides philosophers into "two great camps"—materialists and idealists. Engels—dealing with theories of the two trends much more developed, varied and rich in content than Fraser dealt with—sees the fundamental distinction between them in the fact that while for the materialists nature is primary and spirit secondary, for the idealists the reverse is the case. In between these two camps Engels places the adherents of Hume and Kant, who deny the possibility of knowing the world, or at least of knowing it fully, and calls them *agnostics.* In his *Ludwig Feuerbach* Engels applies this term only to the adherents of Hume (those people whom Fraser calls, and who like to call themselves, "positivists"). But in his article "On Historical Materialism," Engels explicitly speaks of the standpoint of *"the Neo-Kantian agnostic,"* regarding Neo-Kantianism as a variety of agnosticism.[1]

We cannot dwell here on this remarkably correct and profound judgment of Engels' (a judgment which is shamelessly ignored by the Machians). We shall discuss it in detail later on. For the present we shall confine ourselves to pointing to this Marxian terminology and to this meeting of extremes: the views of a consistent materialist and of a consistent idealist on the fundamental philosophical trends. In order to illustrate these trends (with which we shall constantly have to deal in our further exposition) let us briefly note the views of outstanding philosophers of the eighteenth century who pursued a different path from Berkeley.

Here are Hume's arguments. In his *An Enquiry Concerning Human Understanding,* in the chapter (XII) on sceptical philosophy, he says: "It seems evident, that men are carried, by a natural instinct or prepossession, to repose faith in their senses; and that, without any reasoning, or even almost before the use of reason, we always suppose an external universe, which depends not on our perception, but would exist though we and every sensible creature were absent or annihilated. Even the animal creations are governed by a like opinion, and preserve this belief of external objects, in all their thoughts, designs, and actions....

"But this universal and primary opinion of all men is soon destroyed by the slightest philosophy, which teaches us, that nothing can ever be present to the mind but an image or perception, and that the senses are only the inlets, through which these images are conveyed, without being able to produce any immediate intercourse between the mind and the object. The table, which we see, seems to diminish, as we remove farther from it: But the real table, which exists independent of us, suffers no alteration: It was, therefore, nothing but its image, which was present to the mind. These are the obvious dictates of reason; and no man, who reflects, ever doubted, that the existences, which we consider, when we say, 'this house,' and 'that tree' are nothing but perceptions in the mind....

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[1] Friedrich Engels, *"Ueber historischen Materialismus," Neue Zeit,* XI. Jg., Bd. I (1892-93), Nr. 1, S. 18. Translated from the English by Engels himself. (This article was published as an introduction to the English translation of Engels' *Socialism: Utopian and Scientific.—Trans.*)

"By what argument can it be proved, that the perceptions of the mind must be caused by external objects, entirely different from them, though resembling them (if that be possible), and could not arise either from the energy of the mind itself, or from the suggestion of some invisible and unknown spirit, or from some other cause still more unknown to us?

"How shall the question be determined? By experience surely; as all other questions of a like nature. But here experience is, and must be entirely silent. The mind has never anything present to it but the perceptions, and cannot possibly reach any experience of their connection with objects. This supposition of such a connection is, therefore, without any foundation in reasoning.

"To have recourse to the veracity of the Supreme Being, in order to prove the veracity of our senses, is surely making a very unexpected circuit ... if the external world be once called in question, we shall be at a loss to find arguments, by which we may prove the existence of that Being, or any of his attributes."[1]

He says the same thing in his *Treatise of Human Nature* (Part IV, Sec. II, "On Scepticism Towards Sensations"): "Our perceptions are our only objects." By scepticism Hume means the refusal to explain sensations as the effects of objects, spirit, etc., a refusal to reduce perceptions to the external world, on the one hand, and to a deity or to an unknown spirit, on the other. And the author of the introduction to the French translation of Hume, F. Pillon—a philosopher of a trend akin to Mach (as we shall see below)—justly remarks that for Hume the subject and the object are reduced to "groups of various perceptions," to "elements of consciousness, to impressions, ideas, etc."; that the only concern should be with the "groupings and combinations of these elements."[1] The English Humean, Huxley, who coined the apt and correct term "agnosticism," in his *Hume* also emphasises the fact that Hume, regarding "sensations" as the "primary and irreducible states of consciousness," is not entirely consistent on the question how the origin of sensations is to be explained, whether by the effect of objects on man or by the creative power of the mind. "Realism and idealism are equally probable hypotheses" (*i.e.*, for Hume).[2] Hume does not go beyond sensations. "Thus the colours red and blue, and the odour of a rose, are simple impressions.... A red rose gives us a complex impression, capable of resolution into the simple impressions of red colour, rose-scent, and numerous others" (pp. 64-65, *op. cit.*). Hume admits both the "materialist position" and the "idealist position" (p. 82); the "collection of perceptions" may be generated by the Fichtean "ego" or may be a "signification" and even a "symbol" of a "real something." This is how Huxley interprets Hume.

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[1] David Hume, *An Enquiry Concerning Human Understanding. Essays and Treatises*, London, 1882. Vol. II, pp. 124-26.

As for the materialists, here is an opinion of Berkeley given by Diderot, the leader of the Encyclopædists: "Those philosophers are called *idealists* who, being conscious only of their existence and of the sensations which succeed each other within themselves, do not admit anything else. An extravagant system which, to my thinking, only the blind could have originated; a system which, to the shame of human intelligence and philosophy, is the most difficult to combat, although the most absurd of all."[3] And Diderot, who came very close to the standpoint of contemporary materialism (that arguments and syllogisms alone do not suffice to refute idealism, and that here it is not a question for theoretical argument), notes the similarity of the premises both of the idealist Berkeley, and the sensationalist Condillac. In his opinion, Condillac should have undertaken a refutation of Berkeley in order to avoid such absurd conclusions being drawn from the treatment of sensations as the only source of our knowledge.

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[1] *Psychologie de Hume. Traité de la nature humaine, etc.* Trad. par Ch. Renouvier et F. Pillon, Paris, 1878. Introduction, p. x.

[2] Thomas Huxley, *Hume*, London, 1879, p. 74.

[3] *Œuvres complètes de Diderot,* ed. par J. Assézat, Paris, 1875, Vol. I, p. 304.

In the "Conversation Between d'Alembert and Diderot," Diderot states his philosophical position thus: "... Suppose a piano to be endowed with the faculty of sensation and memory, tell me, would it not of its own accord repeat those airs which you have played on its keys? We are instruments endowed with sensation and memory. Our senses are so many keys upon which surrounding nature strikes and which often strike upon themselves. And this is all, in my opinion, that occurs in a piano organised like you and me." D'Alembert retorts that such an instrument would have to possess the faculty of finding food for itself and of reproducing little pianos. Undoubtedly, contends Diderot.—But take an egg. "This is what refutes all the schools of theology and all the temples on earth. What is this egg? A mass that is insensible until the embryo is introduced thither, and when this embryo is introduced, what is it then? An insensible mass, for in its turn, this embryo is only an inert and crude liquid. How does this mass arrive at a different organisation, arrive at sensibility and life? By means of heat. And what produces heat? Motion.... The animal that is hatched from the egg is endowed with all your sensations; it performs all your actions. Would you maintain with Descartes that this is a simple imitating machine? Little children will laugh at you, and the philosophers will reply that if this be a machine then you too are a machine. If you admit that the difference between these animals and you consists only in their organisation, you will prove your common sense and sagacity, you will be right. But from this will follow the conclusion that refutes you; namely, that from inert matter organised in a certain way, impregnated with another bit of inert matter, by heat and motion—sensibility, life, memory, consciousness, emotion, and thought are generated." One of the two, continues Diderot, either admit some "hidden element" in the egg, that penetrates to it in an unknown way at a certain stage of development, an element about which it is unknown whether it occupies space, whether it is material or whether it is created for the purpose—which is contradictory to common sense, and leads to inconsistencies and absurdities; or we must make "a simple supposition which explains everything, namely, that the faculty of sensation is a general property of matter, or a product of its organisation." To d'Alembert's objection that such a supposition implies a quality which in its essence is incompatible with matter, Diderot retorts:

"And how do you know that the faculty of sensation is essentially incompatible with matter, since you do not know the essence of any thing at all, either of matter, or of sensation? Do you understand the nature of motion any better, its existence in a body, its communication from one body to another?" D'Alembert : "Without knowing the nature of sensation, or that of matter, I see, however, that the faculty of sensation is a simple quality, single, indivisible, and incompatible with a divisible subject or substratum." Diderot : "Metaphysico-theological nonsense! What, do you not see that all qualities of matter, that all its forms accessible to our senses are in their essence indivisible? There cannot be a larger or a smaller degree of impenetrability. There may be half of a round body, but there is no half of roundness.... Be a physicist and admit the derivative character of the given effect when you see how it is derived, though you may be unable to explain the relation between the cause and the effect. Be logical and do not replace a cause that exists and explains everything by some cause which it is impossible to conceive, and the connection of which with the effect is even more difficult to conceive, and which engenders an infinite number of difficulties without solving a single one of them." D'Alembert: "And if I do proceed from this cause?" Diderot: "There is only one substance in the universe in men and in animals. A hand-organ is of wood, man of flesh. A finch is of flesh, and a musician is of flesh, but differently organised; but both are of the same origin, of the same formation, have the same functions and the same purpose." D'Alembert: "And what establishes the similarity of sounds between your two pianos?" Diderot: "... The instrument endowed with the faculty of sensation, or the animal, has learned by experience that after a certain sound certain consequences follow outside of it; that other sentient instruments, like itself, or similar animals, approach, recede, demand, offer, wound, caress;—and all these consequences are associated in its memory and in the memory of other animals with the formation of sounds. Mark, in intercourse between people there is nothing beside sounds and actions. And to appreciate the power of my system, mark again that it is faced with that same insurmountable difficulty which Berkeley adduced against the existence of bodies. There was a moment of insanity when the sentient piano imagined that it was the only piano in the world, and that the whole harmony of the universe resided within it."[1]

This was written in 1769. And with this we shall conclude our brief historical inquiry. We shall have more than one occasion to meet "the insane piano" and the harmony of the universe residing within man when we come to analyse "recent positivism."

For the present we shall confine ourselves to one conclusion: the "recent" Machians have not adduced a single argument against the materialists that had not been adduced by Bishop Berkeley.

Let us mention as a curiosity that one of these Machians, Valentinov, vaguely sensing the falsity of his position, has tried to "cover up the traces" of his kinship with Berkeley and has done so in a rather amusing manner. On page 150 of his book we read: "... When those who, speaking of Mach, point to Berkeley, we ask, which Berkeley do they mean? Do they mean the Berkeley who traditionally regards himself [Valentinov wishes to say who is regarded] as a solipsist; or the Berkeley who defends 'the immediate presence and providence of the deity'? Generally, when speaking [?], do they mean Berkeley, the philosophising bishop, the destroyer of atheism, or Berkeley, the thoughtful analyser? With Berkeley the solipsist and preacher of religious metaphysics Mach indeed has nothing in common." Valentinov is muddled; he was unable to make clear to himself why he was obliged to defend the "thoughtful analyser" and idealist, Berkeley, against the materialist Diderot. Diderot drew a clear distinction between the fundamental philosophical trends. Valentinov confuses them, and while doing so very amusingly tries to console us: "We would not consider the 'kinship' of Mach to the idealist views of Berkeley as a philosophical crime," he says, "even if this actually were the case" (p. 149). To confound two irreconcilable fundamental trends in philosophy—really, what "crime" is that? But that is what the whole wisdom of Mach and Avenarius amounts to. We shall now proceed to an examination of this wisdom.

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[1] *Ibid.*, Vol. II, pp. 114-18.

CHAPTER ONE

THE THEORY OF KNOWLEDGE OF EMPIRIO-CRITICISM AND OF DIALECTICAL MATERIALISM. I

1. SENSATIONS AND COMPLEXES OF SENSATIONS

The fundamental premises of the theory of knowledge of Mach and Avenarius are frankly, simply and clearly expounded by them in their early philosophical works. To these works we shall now turn, postponing for later treatment an examination of the corrections and emendations subsequently made by these writers.

"The task of science," Mach wrote in 1872, "can only be: 1. To determine the laws of connection of ideas (Psychology). 2. To discover the laws of connection of sensations (Physics). 3. To explain the laws of connection between sensations and ideas (Psycho-physics)."[1] This is quite clear.

The subject matter of physics is the connection between sensations and not between things or bodies, of which our sensations are the image. And in 1883, in his *Mechanik*, Mach repeats the same thought: "Sensations are not 'symbols of things.' The 'thing' is rather a mental symbol for a complex of sensations of relative stability. Not the things (bodies) but colours, sounds, pressures, spaces, times (what we usually call sensations) are the real *elements* of the world."[2]

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[1] E. Mach, *Die Geschichte und die Wurzel des Satzes von der Erhaltung der Arbeit.* Vortrag, gehalten in der k. Böhm. Gesellschaft der Wissenschaften am 15. Nov. 1871. Prag 1872, S. 57-58.

[2] E. Mach, *Die Mechanik in ihrer Entwicklung historisch-kritisch dargestellt*, 3. Auflage, Leipzig, 1897, S. 173.

About this word "elements," the fruit of twelve years of "reflection," we shall speak later. At present let us note that Mach explicitly states here that things or bodies are complexes of sensations, and that he quite clearly sets up his own philosophical point of view against the opposite theory which holds that sensations are "symbols" of things (it would be more correct to say images or reflections of things). The latter theory is *philosophical materialism*. For instance, the materialist Frederick Engels—the not unknown collaborator of Marx and a founder of Marxism—constantly and without exception speaks in his works of things and their mental pictures or images *(Gedankenabbilder)*, and it is obvious that these mental images arise exclusively from sensations. It would seem that this fundamental standpoint of the "philosophy of Marxism" ought to be known to everyone who speaks of it, and especially to anyone who comes out in print *in the name of* this philosophy. But because of the extraordinary confusion which our Machians have introduced, it becomes necessary to repeat what is generally known. We turn to the first section of *Anti-Dühring* and read: "... things and their mental images ...";[1] or to the first paragraph of the philosophical part, which reads: "But whence does thought obtain these principles [*i.e.*, the fundamental principles of all knowledge]? From itself? No... these forms can never be created and derived by thought out of itself, but only from the external world ... the principles are not the starting point of the investigation [as Dühring who would be a materialist, but cannot consistently adhere to materialism, holds], but its final result; they are not applied to nature and human history, but abstracted from them; it is not nature and the realm of humanity which conform to these principles, but the principles are only valid in so far as they are in conformity with nature and history. That is the only materialistic conception of the matter, and Herr Dühring's contrary conception is idealistic, makes things stand completely on their heads, and fashions the real world out of ideas" (pp. 43-44). Engels, we repeat, applies this "only materialistic conception" everywhere and without exception, relentlessly attacking Dühring for the least deviation from materialism to idealism. Anybody who reads *Anti-Dühring* and *Ludwig Feuerbach* with the slightest care will find scores of instances when Engels speaks of things and their reflections in the human brain, in our consciousness, thought, etc. Engels does not say that sensations or ideas are "symbols" of things, for consistent materialism must here use "image," picture, or reflection instead of "symbol," as we shall show in detail in the proper place. But the question here is not of this or that formulation of materialism, but of the opposition of materialism to idealism, of the difference between the two fundamental *lines* in philosophy. Are we to proceed from things to sensation and thought? Or are we to proceed from thought and sensation to things? The first line, *i.e.*, the materialist line, is adopted by Engels. The second line, *i.e.*, the idealist line, is adopted by Mach. No evasions, no sophisms (a multitude of which we shall yet encounter) can remove the clear and indisputable fact that Ernst Mach's doctrine of things as complexes of sensations is subjective idealism and a simple rehash of Berkeleianism. If bodies are "complexes of sensations," as Mach says, or "combinations of sensations," as Berkeley said, it inevitably follows that the whole world is but my idea. Starting from such a premise it is impossible to arrive at the existence of other people besides oneself: it is the purest solipsism. Much as Mach, Avenarius, Petzoldt and the others may abjure solipsism, they cannot in fact escape solipsism without falling into howling logical absurdities. To make this fundamental element of the philosophy of Machism still clearer, we shall give a few additional quotations from Mach's works. Here is a sample from the *Analyse der Empfindungen:*

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[1] Frederick Engels, *Herr Eugen Dühring's Revolution in Science (Anti-Dühring)*, English ed., 1935, p. 27.—*Trans.*

"We see a body with a point S. If we touch S, that is, bring it into contact with our body, we receive a prick. We can see S without feeling the prick. But as soon as we feel the prick we find S on the skin. Thus, the visible point is a permanent nucleus, to which, according to circumstances, the prick is attached as something accidental. By frequent repetitions of analogous occurrences we finally accustom ourselves to regard *all* properties of bodies as 'effects' which proceed from permanent nuclei and are conveyed to the self through the medium of the body; which effects we call *sansations*...."[1]

In other words, people "accustom" themselves to adopt the standpoint of materialism, to regard sensations as the result of the action of bodies, things, nature on our sense-organs. This "habit," so noxious to the philosophical idealists (a habit acquired by all mankind and all natural science!), is not at all to the liking of Mach, and he proceeds to destroy it:

"... Thereby, however, these nuclei are deprived of their entire sensible content and are converted into naked abstract symbols...."

An old song, most worthy Professor! This is a literal repetition of Berkeley who said that matter is a naked abstract symbol. But it is Ernst Mach, in fact, who goes naked, for if he does not admit that the "sensible content" is an objective reality, existing independently of us, there remains only a "naked abstract" *I*, an *I* infallibly written with a capital letter and italicised, equal to "the insane piano, which imagined that it was the sole existing thing in this world." If the "sensible content" of our sensations is not the external world then nothing exists save this naked *I* engaged in empty "philosophical" acrobatics. A stupid and fruitless occupation!

"... It is then correct that the world consists only of our sensations. In which case we have knowledge *only* of sensations, and the assumption of those nuclei, and of their interaction, from which alone sensations proceed turns out to be quite idle and superfluous. Such a view can only appeal to *half-hearted* realism or *half-hearted* criticism."

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[1] E. Mach, *Analyse der Empfindungen*, Jena, 1900. S. 9 u. 10.—*Trans.*

We have quoted the sixth paragraph of Mach's "anti-metaphysical observations" in full. It is a sheer plagiarism on Berkeley. Not a single idea, not a glimmer of thought, except that "we sense only our sensations." From which there is only one possible inference, namely, that the "world consists only of *my* sensations." The word "our" employed by Mach instead of "my" is employed illegitimately. By this word alone Mach betrays that "half-heartedness" of which he accuses others. For if the "assumption" of the existence of the external world is "idle," if the assumption that the needle exists independently of me and that an interaction takes place between my body and the point of the needle is really "idle and superfluous," then primarily the "assumption" of the existence of other people is idle and superfluous. Only *I* exist, and all other people, as well as the external world, come under the category of idle "nuclei." Holding this point of view one cannot speak of *"our"* sensations; and when Mach does speak of them, it is only a betrayal of his own amazing half-heartedness. It only proves that his philosophy is a jumble of idle and empty words in which their author himself does not believe.

Here is a particularly graphic example of Mach's half-heartedness and confusion. In § 6 of Chapter XI of the *Analyse der Empfindungen* we read: "If I imagine that while I am experiencing sensations, I or someone else could observe my brain with all possible physical and chemical appliances, it would be possible to ascertain with what processes of the organism particular sensations are connected . . ." (p. 198).

Very well! This means, then, that our sensations are connected with definite processes, which take place in the organism in general, and in our brain in particular? Yes, Mach very definitely makes this "assumption"—it would be quite a task not to make it from the standpoint of natural science! But is not this the very "assumption" of those very same "nuclei and their interaction" which our philosopher declared to be idle and superfluous? We are told that bodies are complexes of sensations; to go beyond that, Mach assures us, to regard sensations as a product of the action of bodies upon our sense-organs, is metaphysics, an idle and superfluous assumption, etc., à la Berkeley. But the brain is a body. Consequently, the brain also is no more than a complex of sensations. It follows, then, that with the help of a complex of sensations I (and *I* also am nothing but a complex of sensations) sense complexes of sensations. A delightful philosophy! First sensations are declared to be "the real elements of the world"; on this an "original" Berkeleianism is erected—and then the very opposite views are smuggled in, *viz.*, that sensations are connected with definite processes in the organism. Are not these "processes" connected with an exchange of matter between the "organism" and the external world? Could this exchange of matter take place if the sensations of the particular organism did not give it an objectively correct idea of this external world?

Mach does not ask himself such embarrassing questions when he mechanically jumbles fragments of Berkeleianism with the views of natural science, which instinctively adheres to the materialist theory of knowledge.... In the same paragraph Mach writes: "It is sometimes also asked whether (inorganic) 'matter' experiences sensation...." Does this mean that there is no doubt that *organic* matter experiences sensation? Does this mean that sensation is not something primary but that it is one of the properties of matter? Mach skips over all the absurdities of Berkeleianism!... "The question," he avers, "is natural enough, if we proceed from the current widespread physical notions, according to which matter is the *immediate* and indisputably given *reality,* out of which everything, inorganic and organic, is constructed...." Let us bear in mind this truly valuable admission of Mach's that the current widespread *physical* notions regard matter as the immediate reality, and that only one variety of this reality (organic matter) possesses the well-defined property of sensation.... Mach continues: "Then, indeed, sensation must suddenly arise somewhere in this structure [consisting of matter], or else have previously been present in the foundation. From *our* standpoint the question is a false one. For us matter is not what is primarily given. Rather, what is primarily given are the *elements* (which in a certain familiar relation are designated as sensations)...."

What is primarily given, then, are sensations, although they are "connected" only with definite processes in organic matter! And while uttering such absurdities Mach wants to blame materialism ("the current widespread physical notion") for leaving unanswered the question whence sensation "arises." This is a sample of the "refutation" of materialism by the fideists and their hangers-on. Does any other philosophical standpoint "solve" a problem before enough data for its solution has been collected? Does not Mach himself say in the very same paragraph: "As long as this problem (how far sensation extends in the organic world) has not been solved even in a single special case, no answer to the question is possible."

The difference between materialism and "Machism" in this particular question is thus reduced to the following. Materialism, in full agreement with natural science, takes matter as primary and regards consciousness, thought and sensation as secondary, because in its well-defined form sensation is associated only with the higher forms of matter (organic matter), while "in the foundation of the structure of matter" one can only surmise the existence of a faculty akin to sensation. Such, for example, is the supposition of the well-known German scientist Ernst Haeckel, the English biologist Lloyd Morgan and others, not to speak of Diderot's conjecture mentioned above. Machism holds to the opposite, the idealist point of view, and at once lands into an absurdity: since, in the first place, sensation is taken as primary, in spite of the fact that it is associated only with definite processes in matter organised in a definite way; and, since, in the second place, the basic premise that bodies are complexes of sensations is violated by the assumption of the existence of other living beings in general, of other "complexes" beside the given great *I*.

The word "element," which many naïve people (as we shall see) take to be some sort of a new discovery, in reality only obscures the question, for it is a meaningless term which creates the false impression that a solution or a step forward has been achieved. This impression is a false one, because there still remains to be investigated and reinvestigated how matter, apparently entirely devoid of sensation, is related to matter which, though composed of the same atoms (or electrons), is yet endowed with a well-defined faculty of sensation. Materialism clearly formulates the as yet unsolved problem and thereby stimulates the attempt to solve it, to undertake further experimental investigation. Machism, *i.e.*, a species of muddled idealism, befogs the issue and sidetracks it by means of the futile verbal trick, "element."

Here is a passage from Mach's latest, comprehensive and conclusive philosophical work that clearly betrays the falsity of this idealist trick. In his *Erkenntnis und Irrtum* we read: "While there is no difficulty in constructing *(aufzubauen) every physical* experience out of sensations, *i.e.*, *psychical* elements, it is impossible to imagine *(ist keine Möglichkeit abzusehen)* how any *psychical* experience can be composed *(darstellen)* of the elements employed in modern physics, *i.e.*, mass and motion (in their rigidity—*Starrheit*—which is serviceable only for this special science)."[1]

Of the rigidity of the conceptions of many modern scientists and of their metaphysical (in the Marxian sense of the term, *i.e.*, anti-dialectical) views, Engels speaks repeatedly and very precisely. We shall see later that it was just on this point that Mach went astray, because he did not understand or did not know the relation between relativism and dialectics. But this is not what concerns us here. It is important for us here to note how glaringly Mach's *idealism* emerges, in spite of the confused—ostensibly new—terminology. There is no difficulty, you see, in constructing any physical element out of sensations, *i.e.*, psychical elements!

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[1] E. Mach, *Erkenntnis und Irrtum*, 2. Auflage, 1906, S. 12, Anmerkung.

Oh yes, such constructions, of course, are not difficult, for they are purely verbal constructions, shallow scholasticism, serving as a loophole for fideism. It is not surprising after this that Mach dedicates his works to the immanentists; it is not surprising that the immanentists, who profess the most reactionary kind of philosophical idealism, welcome Mach with open arms. The "recent positivism" of Ernst Mach was only about two hundred years too late. Berkeley had already sufficiently shown that "out of sensations, *i.e.*, psychical elements," nothing can be "built" except *solipsism*. As regards materialism, against which Mach here, too, sets up his own views, without frankly and explicitly naming the "enemy," we have already seen in the case of Diderot what the real views of the materialists are. These views do not consist in deriving sensation from the movement of matter or in reducing sensation to the movement of matter, but in recognising sensation as one of the properties of matter in motion. On this question Engels shared the standpoint of Diderot. Engels dissociated himself from the "vulgar" materialists, Vogt, Büchner and Moleschott, for the very reason, among others, that they erred in believing that the brain secretes thought *in the same way* as the liver secretes bile. But Mach, who constantly sets up his views in opposition to materialism, ignores, of course, all the great materialists—Diderot, Feuerbach, Marx and Engels—just as all other official professors of official philosophy do.

In order to characterise Avenarius' earliest and basic view, let us take his first independent philosophical work, *Philosophie als Denken der Welt gemäß dem Prinzip des kleinsten Kraftmaßes. Prolegomena zu einer Kritik der reinen Erfahrung,* which appeared in 1876. Bogdanov in his *Empirio-Monism* (Book 1, 2nd ed., 1905, p. 12, note) says that "in the development of Mach's views, the starting point was philosophical idealism, while a realistic tinge was characteristic of Avenarius from the very beginning." Bogdanov said so because he believed what Mach said (see *Analyse der Empfindungen,* S. 295). Bogdanov should not have believed Mach, and his assertion is diametrically opposed to the truth. On the contrary, Avenarius' idealism emerges so clearly in his work of 1876 that Avenarius himself in 1891 was obliged to admit it. In the introduction to *Der menschliche Weltbegriff* Avenarius says:[1] "He who has read my first systematic work, *Philosophie, etc.*, will at once have presumed that I would have attempted to treat the problems of a criticism of pure experience from the 'idealist' standpoint... [but] the sterility of ... idealism compelled me to doubt the correctness of my previous path." This idealist starting point of Avenarius' is universally acknowledged in philosophical literature. Of the French writers I shall refer to Couwelaert, who says that Avenarius' philosophical standpoint in the *Prolegomena* is "monistic idealism."[2] Of the German writers, I shall name Rudolph Willy, Avenarius' disciple, who says that "Avenarius in his youth—and particularly in his work of 1876—was totally under the spell *(ganz im Banne)* of so-called epistemological idealism."[3]

And, indeed, it would be ridiculous to deny the idealism in Avenarius' *Prolegomena,* where he explicitly states that *"only sensation can be thought of as the existing"* (pp. 10 and 65 of the second German edition; all italics in quotations are ours). This is how Avenarius himself presents the contents of § 116 of his work. Here is the paragraph in full: "We have recognised that the existing *(das Seiende)* is substance endowed with sensation; the substance falls away... [it is "more economical," don't you see, there is "a lesser expenditure of effort" in thinking that there is no "substance" and that no external world exists!], sensation remains; we must then regard the existing as sensation, at the basis of which there is nothing which does not possess sensation *(nichts Empfindungsloses)*."

Sensation, then, exists without "substance," *i.e.,* thought exists without brain! Are there really philosophers capable of defending this brainless philosophy? There are! And Professor Richard Avenarius is one of them. And we must pause for a while to consider this defence, difficult though it be for a normal person to take it seriously. Here, in §§ 89 and 90 of this same work, is Avenarius' argument:

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[1] *Der menschliche Weltbegriff,* 1891, Vorwort, S. IX u. X.

[2] F. van Couwelaert, "*L'Empiriocriticisme*" in *Revue néo-scholastique,* 1907, Feb., p. 51.

[3] Rudolph Willy, *Gegen die Schulweisheit. Eine Kritik der Philosophie,* München 1905, S. 170.

". . . And so the proposition that motion produces sensation is based on apparent experience only. This experience, which includes the act of perception, consists, presumably, in the fact that sensation is generated in a certain kind of substance (brain) as a result of transmitted motion (excitation) and with the help of other material conditions (*e.g.*, blood). However—apart from the fact that such generation has never itself been observed—in order to construct the supposed experience, as an experience which is real in all its component parts, empirical proof, at least, is required to show that sensation, which assumedly is caused in a certain substance by transmitted motion, did not already exist in that substance in one way or another; so that the appearance of sensation cannot be conceived of in any other way than as a creative act on the part of the transmitted motion. Thus only by proving that where a sensation now appears there was none previously, not even a minimal one, would it be possible to establish a fact which, denoting as it does some act of creation, contradicts the rest of experience and radically changes our conception of nature *(Naturanschauung)*. But such proof is not furnished by any experience, and cannot be furnished by any experience; on the contrary, the notion of a state of a substance totally devoid of sensation which subsequently begins to experience sensation is only a hypothesis. But such a hypothesis merely complicates and obscures our understanding instead of simplifying and clarifying it.

"Should the so-called experience, *viz.*, that the sensation is *caused* by a transmitted motion in a substance that begins to perceive from this moment, prove upon closer examination to be only apparent, there still remains sufficient material in the content of the experience to ascertain at least the relative origin of sensation from conditions of motion, namely, to ascertain that the sensation which is present, although latent or minimal, or for some reason not manifest to the consciousness, becomes, owing to transmitted motion, released or enhanced or made manifest to the consciousness. However, even this bit of the remaining content of experience is only an appearance. Were we even by an ideal observation to trace the motion proceeding from the moving substance A, transmitted through a series of intermediate centres and reaching the substance B, which is endowed with sensation, we should at best find that sensation in substance B becomes developed or enhanced simultaneously with the reception of the incoming motion—but we should not find that this occurred as a *consequence* of the motion...."

We have purposely quoted this refutation of materialism by Avenarius in full, in order that the reader may see to what truly pitiful sophistries "recent" empirio-critical philosophy resorts. We shall compare with the argument of the idealist Avenarius the *materialist* argument of—Bogdanov, if only to punish Bogdanov for his betrayal of materialism!

In long bygone days, fully nine years ago, when Bogdanov was half "a natural-historical materialist" (that is, an adherent of the materialist theory of knowledge, to which the overwhelming majority of contemporary scientists instinctively hold), when he was only half led astray by the muddled Ostwald, he wrote: "From ancient times to the present day, descriptive psychology has adhered to the classification of the facts of consciousness into three categories: the domain of sensations and ideas, the domain of emotions and the domain of impulses.... To the first category belong the *images* of phenomena of the outer or inner world, as taken by themselves in consciousness.... Such an image is called a 'sensation' if it is directly produced through the sense-organs by its corresponding external phenomenon."[1] And a little farther on he says: "Sensation ... arises in consciousness as a result of a certain impulse from the external environment transmitted by the external sense-organs" (p. 222). And further: "Sensation is the foundation of mental life; it is its immediate connection with the external world" (p. 240). "At each step in the process of sensation a transformation of the energy of external excitation into a fact of consciousness takes place" (p. 133). And even in 1905, when with the gracious assistance of Ostwald and Mach Bogdanov had abandoned the materialist standpoint in philosophy for the idealist standpoint, he wrote (from forgetfulness!) in his *Empirio-Monism:* "As is-known, the energy of external excitation, transformed at the nerve-ends into a 'telegraphic' form of nerve current (still insufficiently investigated but devoid of all mysticism), first reaches the neurons that are located in the so-called 'lower' centres—ganglial, cerebral-spinal, subcortical, etc." (Book 1, 2nd ed., 1905, p. 118.)

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[1] A. Bogdanov, *The Fundamental Elements of the Historical Outlook on Nature*, St. Petersburg, 1899, p. 216.

For every scientist who has not been led astray by professorial philosophy, as well as for every materialist, sensation is indeed the direct connection between consciousness and the external world; it is the transformation of the energy of external excitation into a state of consciousness. This transformation has been, and is, observed by each of us a million times on every hand. The sophism of idealist philosophy consists in the fact that it regards sensation as being not the connection between consciousness and the external world, but as a fence, a wall, separating consciousness from the external world—not as an image of the external phenomenon corresponding to the sensation, but as the "sole entity." Avenarius gave but a slightly changed form to this old sophism, which had been already worn threadbare by Bishop Berkeley. Since we do not yet know all the conditions of the connection we are constantly observing between sensation and matter organised in a definite way, we therefore acknowledge the existence of sensation alone—that is what the sophism of Avenarius reduces itself to.

To conclude our description of the fundamental idealist premises of empirio-criticism, we shall briefly refer to the English and French representatives of this philosophical trend. Mach explicitly says of Karl Pearson, the Englishman, that he (Mach) is "in agreement with his epistemological *(erkenntniskritischen)* views on all essential points" *(Mechanik,* S. IX). Pearson in turn agrees with Mach.[1] For Pearson "real things" are "sense-impressions." He declares the recognition of things outside the boundaries of sense-impressions to be metaphysics. Pearson fights materialism with great determination (although he does not know Feuerbach, or Marx, or Engels); his arguments do not differ from those analysed above. However, the desire to masquerade as a materialist is so foreign to Pearson (that is a specialty of the Russian Machians), Pearson is so incautious . . . that he invents no "new" names for his philosophy and simply declares that his views and those of Mach are *"idealist"* *(ibid.,* p. 326)! He traces his genealogy directly to Berkeley and Hume. The philosophy of Pearson, as we shall repeatedly find, excels that of Mach in integrity and consistency.

Mach explicitly declares his solidarity with the French physicists, Pierre Duhem and Henri Poincaré.[2] We shall have occasion to deal with the particularly confused and inconsistent philosophical views of these writers in the chapter on the new physics. Here we shall content ourselves with noting that for Poincaré things are "groups of sensations"[3] and that a similar view is casually expressed by Duhem.[4]

We shall now proceed to examine how Mach and Avenarius, who admitted the idealist character of their original views, *corrected* them in their subsequent works.

2. "THE DISCOVERY OF THE WORLD-ELEMENTS"

Such is the title under which Friedrich Adler, lecturer at the University of Zürich, probably the only German author also anxious to supplement Marx by Machism, writes of Mach.[1] And this naïve university lecturer must be given his due: in his simplicity of heart he does Machism more harm than good. At least, he puts the question point-blank —did Mach really "discover the world-elements"? If so, then, only very backward and ignorant people, of course, can still remain materialists. Or is this discovery a return on the part of Mach to the old philosophical errors?

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[1] Karl Pearson, *The Grammar of Science,* 2nd ed., London, 1900, p. 326.

[2] *Analyse der Empfindungen,* S. 4; Vgl. *Erkenntnis und Irrtum,* Vorwort, 2. Auflage.

[3] Henri Poincaré, *La valeur de la science,* Paris, 1905.

[4] P. Duhem, *La théorie physique, son objet et sa structure,* Paris, 1906, pp. 6, 10.

We saw that Mach in 1872 and Avenarius in 1876 held a purely idealist view; for them the world is our sensation. In 1883 Mach's *Mechanik* appeared, and in the preface to the first edition Mach refers to Avenarius' *Prolegomena,* and greets his ideas as being "very close" *(sehr verwandte)* to his own philosophy. Here are the arguments in the *Mechanik* concerning the elements: "All natural science can only picture and represent *(nachbilden und vorbilden)* complexes of those *elements* which we ordinarily call sensations. It is a matter of the connection of these elements.... The connection of A (heat) with B (flame) is a problem of *physics,* that of A and N (nerves) a problem of *physiology.* Neither exists alone; both exist simultaneously. Only temporarily can we neglect either. Even processes that are apparently purely mechanical, are thus ... always physiological" (*op. cit.*, p. 498). We find the same in the *Analyse der Empfindungen:* "Wherever... the terms 'sensation,' 'complex of sensations,' are used alongside of or in place of the terms 'element,' 'complex of elements,' it must be borne in mind that it is *only* in this *connection* [namely, in the connection of A, B, C with K, L, M, that is, in the connection of "complexes which we ordinarily call bodies" with "the complex which we call our body"] and relation, only in this functional dependence that the elements are *sensations.* In another functional dependence they are at the same time physical objects" (p. 13). "A colour is a physical object when we consider its dependence, for instance, upon the source of illumination (other colours, temperatures, spaces and so forth). When we, however, consider its *dependence* upon the *retina* (the elements K,L,M), it is a *psychological* object, a *sensation*" (p. 14).

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[1] Friedrich W. Adler, *"Die Entdeckung der Weltelemente (zu Ernst Machs* 70. Geburtstag)," *Der Kampf* 1908, Nr. 5. (Februar). Translated in the *International Socialist Review.* 1908, No. 10 (April).

Thus the discovery of the world-elements amounts to this:

1) all that exists is declared to be sensation,

2) the sensations are called elements,

3) elements are divided into the physical and the psychical; the latter is that which depends on the human nerves and the human organism generally; the former does not depend on them;

4) the connection of physical elements and the connection of psychical elements, it is declared, do not exist separately from each other; they exist only in conjunction;

5) it is possible only temporarily to leave one or the other connection out of account;

6) the "new" theory is declared to be free from "one-sidedness."[1]

Indeed, it is not one-sidedness we have here, but an incoherent jumble of antithetical philosophical points of view. Since you base yourself *only* on sensations you do not correct the "one-sidedness" of your idealism by the term "element," but only confuse the issue and cravenly hide from your own theory. In word, you eliminate the antithesis between the physical and psychical,[2] between materialism (which regards nature, matter, as primary) and idealism (which regards spirit, mind, sensation as primary); in deed, you promptly restore this antithesis; you restore it surreptitiously, retreating from your own fundamental premises!

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[1] Mach says in the *Analyse der Empfindungen:* "These elements are usually called sensations. But as that term already implies a one-sided theory, we prefer to speak simply of elements" (pp. 17-18).

[2] *"The antithesis between the Ego and the world, sensation or appearance and the thing, then vanishes,* and everything reduces itself to *a complex of elements*" (*ibid.*, p. 11).

For, if elements are sensations, you have no right even for a moment to accept the existence of "elements" *independently* of my nerves and my mind. But if you do admit physical objects that are independent of my nerves and my sensations and that cause sensation only by acting upon my retina—you are disgracefully abandoning your "one-sided" idealism and adopting the standpoint of "one-sided" materialism! If colour is a sensation only depending upon the retina (as natural science compels you to admit), then light rays, falling upon the retina, produce the sensation of colour. This means that outside us, independently of us and of our minds, there exists a movement of matter, let us say of ether waves of a definite length and of a definite velocity, which, acting upon the retina, produce in man the sensation of a particular colour. This is precisely how natural science regards it. It explains the sensations of various colours by the various lengths of light-waves existing outside the human retina, outside man and independently of him. This is materialism: matter acting upon our sense-organs produces sensation. Sensation depends on the brain, nerves, retina, etc., *i.e.,* on matter organised in a definite way. The existence of matter does not depend on sensation. Matter is primary. Sensation, thought, consciousness are the supreme product of matter organised in a particular way. Such are the views of materialism in general, and of Marx and Engels in particular. Mach and Avenarius *secretly* smuggle in materialism by means of the word "element," which *supposedly* frees their theory of the "one-sidedness" of subjective idealism, *supposedly* permits the assumption that the psychical is dependent on the retina, nerves and so forth, and the assumption that the physical is independent of the human organism. In fact, of course, the trick with the word "element" is a wretched sophistry, for a materialist who reads Mach and Avenarius will immediately ask: what are the "elements"? It would, indeed, be childish to think that one can dispose of the fundamental philosophical trends by inventing a new word. Either the "element" is a *sensation,* as all empirio-criticists, Mach, Avenarius, Petzoldt,[1] etc., maintain—in which case your philosophy, gentlemen, is *idealism* vainly seeking to hide the nakedness of its solipsism under the cloak of a more "objective" terminology; or the "element" is not a sensation—in which case *absolutely no thought whatever* is attached to the "new" term; it is merely an empty bauble.

Take Petzoldt, for instance, the last word in empirio-criticism, as V. Lessevich, the first and most outstanding Russian empirio-criticist describes him.[2] Having defined elements as sensations, he says in the second volume of the work mentioned: "In the statement that 'sensations are the elements of the world' one must guard against taking the term 'sensation' as denoting something only subjective and therefore ethereal, transforming the ordinary picture of the world into an illusion *(Verflüchtigendes)*."[3]

One speaks of what hurts one most! Petzoldt feels that the world "evaporates" *(verflüchtigt sich)*, or becomes transformed into an illusion, when the world-elements are regarded as sensations. And the good Petzoldt imagines that he helps matters by the reservation that sensation must not be taken as something only subjective! Is this not a ridiculous sophism? Does it make any difference whether we "take" sensation as sensation or whether we try to stretch the meaning of the term? Does this do away with the fact that sensations in man are connected with normally functioning nerves, retina, brain, etc., that the external world exists independently of our sensations? If you are not trying to evade the issue by a subterfuge, if you are really in earnest in wanting to "guard" against subjectivism and solipsism, you must above all guard against the fundamental idealist premises of your philosophy; you must replace the idealist line of your philosophy (from sensations to the external world) by the materialist line (from the external world to sensations); you must abandon that empty and muddled verbal embellishment, "element," and simply say that colour is the result of the action of a physical object on the retina, which is the same as saying that sensation is a result of the action of matter on our sense-organs.

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[1] Joseph Petzoldt, *Einführung in die Philosophie der reinen Erfahrung*, Bd. I, Leipzig, 1900, S. 113: "Elements are sensations in the ordinary sense of simple, irreducible perceptions *(Wahrnehmungen)*."

[2] V. Lessevich, *What is Scientific* [read: fashionable, professorial, eclectic] *Philosophy?*, St. Petersburg, 1891, pp. 229, 247.

[3] Petzoldt, *op. cit.*, Bd. II, 1904, S. 329.

Let us take Avenarius. The most valuable material on the question of the "elements" is to be found in his last work (and, it might be said, the most important for the comprehension of his philosophy), *Notes on the Concept of the Subject of Psychology.*[1] The author, by the way, here gives a very "graphic" table (Vol. XVIII, p. 410), the main part of which we reproduce here:

I. Things, or the substantial *(Sachhaftes)*	Elements, complexes of elements Corporeal things
II. Thoughts, or the mental *(Gedankenhaftes)*	Incorporeal things, recollections and fantasies

Compare this with what Mach says after all his elucidation of the "elements" (*Analyse der Empfindungen,* S. 23): "It is not bodies that produce sensations, but complexes of elements (complexes of sensations) that make up bodies." Here you have the "discovery of the world-elements" that overcomes the one-sidedness of idealism and materialism! At first we are assured that the "elements" are something new, both physical and psychical at the same time; then a little correction is surreptitiously inserted: instead of the crude, materialist differentiation of matter (bodies, things) and the psychical (sensations, recollections, fantasies) we are presented with the doctrine of "recent positivism" regarding elements substantial and elements mental. Adler (Fritz) did not gain very much from "the discovery of the world-elements"!

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[1] R. Avenarius, "*Bemerkungen zum Begriff des Gegenstandes der Psychologie*" in *Vierteljahrsschrift für wissenschaftliche Philosophie,* Bd. 18, 1894, und Bd. 19, 1895.

Bogdanov, arguing against Plekhanov in 1906, wrote: "... I cannot own myself a Machian in philosophy. In the general philosophical conception there is only one thing I borrowed from Mach—the idea of the neutrality of the elements of experience in relation to the 'physical' and 'psychical,' and the dependence of these characteristics solely on the *connection* of experience."[1] This is as though a religious man were to say—I cannot own myself a believer in religion, for there is "only one thing" I have borrowed from the believers—the belief in God. This "one thing" which Bogdanov borrowed from Mach is the *basic error* of Machism, the basic falsity of its entire philosophy. Those deviations of Bogdanov's from empirio-criticism to which he himself attaches great significance are in fact of entirely secondary importance and amount to nothing more than inconsiderable private and individual differences between the various empirio-criticists who are approved by Mach and who approve Mach (we shall speak of this in greater detail later). Hence when Bogdanov was annoyed at being confused with the Machians he only revealed his failure to understand what *radically* distinguishes materialism from what is common to Bogdanov and to all other Machians. How Bogdanov developed, improved or worsened Machism is not important. What is important is that he has abandoned the materialist standpoint and has thereby inevitably condemned himself to confusion and idealist aberrations.

In 1899, as we saw, Bogdanov had the correct standpoint when he wrote: "The image of the man before me, directly given to me by vision, is a sensation."[2] Bogdanov did not trouble to give a criticism of this earlier position of his. He blindly believed Mach and began to repeat after him that the "elements" of experience are neutral in relation to the physical and psychical. "As has been established by recent positivist philosophy," wrote Bogdanov in Book I of *Empirio-Monism* (2nd ed., p. 90), "the elements of psychic experience are identical with the elements of experience in general, as they are with the elements of physical experience." Or in 1906 (Bk. III, p. xx): "as to 'idealism,' can it be called idealism merely on the grounds that the elements of 'physical experience' are regarded as identical with the elements of 'psychic experience,' or with elementary sensations—when this is simply an indubitable fact?"

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[1] *Empirio-Monism*, Bk. III, St. Petersburg, 1906, p. xli.

[2] *The Fundamental Elements*, etc., p. 216; *cf.* the quotations cited above.

Here we have the true source of all Bogdanov's philosophical misadventures, a source which he shares with the rest of the Machians. We can and must call it idealism when "the elements of physical experience" (*i.e.*, the physical, the external world, matter) are regarded as identical with sensations, for this is sheer Berkeleianism. There is not a trace here of recent philosophy, or positivist philosophy, or of indubitable fact. It is merely an old, old idealist sophism. And were one to ask Bogdanov how he would prove the "indubitable fact" that the physical is identical with sensations, one would get no other argument save the eternal refrain of the idealists: I am aware only of my sensations; the "testimony of self-consciousness" *(die Aussage des Selbstbewußtseins)* of Avenarius in his *Prolegomena* (2nd German ed., § 93, p. 56); or: "in our experience [which testifies that "we are sentient substance"] sensation is given us with more certainty than is substantiality" (*ibid.*, § 91, p. 55), and so on and so forth. Bogdanov (trusting Mach) accepted a reactionary philosophical trick as an "indubitable fact." For, indeed, not a single fact was or could be cited which would refute the view that sensation is an image of the external world—a view which was shared by Bogdanov in 1899 and which is shared by science to this day. In his idealist wanderings the physicist Mach has completely strayed from the path of "modern science." Regarding this important circumstance, which Bogdanov overlooked, we shall have much to say later.

One of the circumstances which helped Bogdanov to jump so quickly from the materialism of the natural scientists to the muddled idealism of Mach was (apart from the influence of Ostwald) Avenarius' doctrine of the dependent and independent series of experience. Bogdanov himself expounds the matter in Book I of his *Empirio-Monism* thus: "In so far as the data of experience appear in *dependence upon the state of the particular nervous system,* they form the *psychical world* of the particular person; in so far as the data of experience are taken *outside of such a dependence,* we have before us the *physical world.* Avenarius therefore characterises these two realms of experience respectively as the *dependent series* and the *independent series* of experience" (p. 18).

That is just the whole trouble, the doctrine of the *independent* (*i.e.,* independent of human sensation) "series" is a surreptitious importation of materialism, which, from the standpoint of a philosophy that maintains that bodies are complexes of sensations, that sensations are "identical" with physical "elements," is illegitimate, arbitrary, and eclectic. For once you have recognised that the source of light and light-waves exists *independently* of man and the human consciousness, that colour is dependent on the action of these waves upon the retina, you have in fact adopted the materialist standpoint and have *completely destroyed* all the "indubitable facts" of idealism, together with all "the complexes of sensations," the elements discovered by recent positivism, and similar nonsense.

That is just the whole trouble. Bogdanov (like the rest of the Russian Machians) has never looked into the idealist views originally held by Mach and Avenarius, has never examined their fundamental idealist premises, and has therefore failed to discover the illegitimacy and eclecticism of their subsequent attempts to smuggle in materialism surreptitiously. Yet, just as the initial idealism of Mach and Avenarius is generally acknowledged in philosophical literature, so is it generally acknowledged that subsequently empirio-criticism endeavoured to swing towards materialism. Couwelaert, the French writer quoted above, asserts that Avenarius' *Prolegomena* is "monistic idealism," the *Kritik der reinen Er-*

fahrung (1888-90) is "absolute realism," while *Der menschliche Weltbegriff* (1891) is an attempt "to explain" the change. Let us note that the term realism is here employed as the antithesis of idealism. Following Engels, I use *only* the term materialism in this sense, and consider it the sole correct terminology, especially since the term "realism" has been bedraggled by the positivists and the other muddleheads who vacillate between materialism and idealism. For the present it will suffice to note that Couwelaert had the indisputable fact in mind that in the *Prolegomena* (1876) sensation, according to Avenarius, is the only entity, while "substance" —in accordance with the principle of "the economy of thought"!—is eliminated, and that in the *Kritik der reinen Erfahrung* the physical is taken as the *independent series,* while the psychical and, consequently, sensations, are taken as the dependent series.

Avenarius' disciple Rudolph Willy likewise admits that Avenarius was a "complete" idealist in 1876, but subsequently "reconciled" *(Ausgleich)* "naïve realism" (*i.e.*, the instinctive, unconscious materialist standpoint adopted by humanity, which regards the external world as existing independently of our minds) with this teaching *(loc. cit.).*

Oskar Ewald, the author of the book *Avenarius as the Founder of Empirio-Criticism,* says that this philosophy combines contradictory idealist and "realist" (he should have said materialist) elements (not in Mach's sense, but in the human sense of the term element). For example, "the absolute [method of consideration] would perpetuate naïve realism, the relative would declare exclusive idealism as permanent."[1] Avenarius calls the absolute method of consideration that which corresponds to Mach's connection of "elements" outside our body, and the relative that which corresponds to Mach's connection of "elements" dependent on our body.

But of particular interest to us in this respect is the opinion of Wundt, who himself, like the majority of the above-mentioned writers, adheres to the confused idealist standpoint, but who has analysed empirio-criticism perhaps more attentively than all the others. P. Yushkevich has the following to say in this connection: "It is interesting to note that Wundt regards empirio-criticism as the most scientific form of the latest type of materialism,"[1] *i.e.*, the type of those materialists who regard the spiritual as a function of corporeal processes (and whom—we would add—Wundt defines as standing midway between Spinozism and absolute materialism).[2]

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[1] Oskar Ewald, *Richard Avenarius als Begründer des Empiriokritizismus*, Berlin 1905. S. 66.

True, this opinion of Wundt's is extremely interesting. But what is even more "interesting" is Mr. Yushkevich's attitude towards the books and articles on philosophy of which he treats. This is a typical example of the attitude of our Machians to such matters. Gogol's Petrushka[3] used to read and find it interesting that letters always combined to make words. Mr. Yushkevich read Wundt and found it "interesting" that Wundt accused Avenarius of materialism. If Wundt is wrong, why not refute him? If he is right, why not explain the antithesis between materialism and empirio-criticism? Mr. Yushkevich finds what the idealist Wundt says "interesting," but this Machian regards it as a waste of effort to endeavour to go to the root of the matter (probably on the principle of "the economy of thought")....

The point is that by informing the reader that Wundt accuses Avenarius of materialism, and by not informing him that Wundt regards some aspects of empirio-criticism as materialism and others as idealism and holds that the connection between the two is artificial, Yushkevich entirely *distorted the matter*. Either this gentleman absolutely does not understand what he reads, or he was prompted by a desire to indulge in false self-praise with the help of Wundt, as if to say: you see, the official professors regard us, too, as materialists, and not as muddleheads.

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[1] P. Yushkevich, *Materialism and Critical Realism*, St. Petersburg, 1908, p. 15.

[2] W. Wundt, "*Ueber naiven und kritischen Realismus*" in *Philosophische Studien*, Bd. XIII, 1898, S. 334.

[3] In *Dead Souls*.—*Trans.*

The above-mentioned article by Wundt constitutes a large book (more than 300 pages), devoted to a detailed analysis first of the immanentist school, and then of the empirio-criticists. Why did Wundt connect these two schools? Because he considers them *closely akin*; and this opinion, which is shared by Mach, Avenarius, Petzoldt and the immanentists is, as we shall see later, entirely correct. Wundt shows in the first part of this article that the immanentists are idealists, subjectivists and adherents of fideism. This, too, as we shall see later, is a perfectly correct opinion, although Wundt expounds it with a superfluous ballast of professorial erudition, with superfluous niceties and reservations, which is to be explained by the fact that Wundt himself is an idealist and fideist. He reproaches the immanentists not because they are idealists and adherents of fideism, but because, in his opinion, they arrive at these great principles by incorrect methods. Further, the second and third parts of Wundt's article are devoted to empirio-criticism. There he quite definitely points out that very important theoretical propositions of empirio-criticism (*e.g.*, the interpretation of "experience" and the "principal co-ordination," of which we shall speak later) are *identical* with those held by the immanentists (*die empiriokritische in Uebereinstimmung mit der immanenten Philosophie annimmt,* S. 382). Other of Avenarius' theoretical propositions are borrowed from materialism, and in general empirio-criticism is a *"motley"* (*bunte Mischung, ibid.*, S. 57), in which the "various component elements *are entirely heterogeneous*" (*an sich einander völlig heterogen sind,* S. 56).

Wundt regards Avenarius' doctrine of the *"independent vital series,"* in particular, as one of the materialist morsels of the Avenarius-Mach hotchpotch. If you start from the "system C" (that is how Avenarius—who was very fond of making erudite play of new terms—designates the human brain or the nervous system in general), and if the psychical is for you a function of the brain, then this "system C" is a "metaphysical substance"—says Wundt (*ibid.*, p. 64), and your doctrine is materialism. It should be said that many idealists and all agnostics (Kantians and Humeans included) call the materialists metaphysicians, because it seems to them that to recognise the existence of an external world independent of the human mind is to transcend the bounds of experience. As to this terminology and its utter incorrectness from the point of view of Marxism, we shall speak in its proper place. Here it is important to note that the recognition of the "independent" series by Avenarius (and also by Mach, who expresses the same idea in different words), is according to the general opinion of philosophers of various parties, *i.e.*, of various trends in philosophy, an *appropriation from materialism.* If you assume that everything that exists is sensation, or that bodies are complexes of sensations, you cannot, without violating all your fundamental premises, all "your" philosophy, arrive at the conclusion that the *physical* exists *independently* of our minds, and that sensation is a *function* of matter organised in a definite way. Mach and Avenarius, in their philosophy, combine fundamental idealist premises with individual materialist deductions for the very reason that their theory is an example of that "pauper's broth of eclecticism" of which Engels speaks with just contempt.[1]

This eclecticism is particularly marked in Mach's latest philosophical work *Erkenntnis und Irrtum,* 2nd edition, 1906. We have already seen that Mach there declared that "there is no difficulty in constructing every physical element out of sensation, *i.e.*, out of psychical elements," and in the same book we read: "Dependencies outside the boundary of U [=*Umgrenzung, i.e.*, "the spatial boundary of our body," p. 8] are *physics in the broadest sense*" (p. 323, § 4). "To obtain those dependencies in a pure state *(rein erhalten)* it is necessary as much as possible to eliminate the influence of the observer, that is, of those elements that lie within U" *(loc. cit.)*. Well, well, the titmouse first promised to set the sea on fire . . . *i.e.*, to construct physical elements from psychical elements, and then it turns out that physical elements lie beyond the boundary of psychical elements, "which lie within our body"! A remarkable philosophy!

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[1] The foreword to *Ludwig Feuerbach,* dated February 1888. These words of Engels' refer to German professorial philosophy in general. The Machians who would like to be Marxists, being unable to grasp the significance and meaning of this thought of Engels', sometimes take refuge in a wretched evasion: "Engels did not yet know Mach" (Fritz Adler). On what is this opinion based? On the fact that Engels does not quote Mach and Avenarius? There are no other grounds, and these grounds are worthless, for Engels does not name *any* of the eclectics by name, and it is hardly likely that Engels did not know Avenarius, who had been editing a quarterly of "scientific" philosophy ever since 1876.

Another example: "A perfect *(vollkommenes)* gas, a perfect liquid, a perfect elastic body, does not exist; the physicist knows that his fictions only approximate to the facts and arbitrarily simplify them; he is aware of the divergence, which cannot be eliminated" (p. 418, § 30).

What divergence *(Abweichung)* is meant here? The divergence of what from what? Of thought (physical theory) from the facts. And what are thoughts, ideas? Ideas are the "tracks of sensations" (p. 9). And what are facts? Facts are "complexes of sensations." And so, the divergence of the tracks of sensations from complexes of sensations cannot be eliminated.

What does this mean? It means that Mach *forgets* his own theory and, when treating of various problems of physics, speaks plainly, without idealist twists, *i.e.*, materialistically. All the "complexes of sensations" and the entire stock of Berkeleian wisdom vanish. The physicists' theory proves to be a reflection of bodies, liquids, gases existing outside us and independently of us, a reflection which is, of course, approximate; but to call this approximation or simplification "arbitrary" is wrong. *In fact,* sensation is here regarded by Mach just as it is regarded by all science which has not been "purified" by the disciples of Berkeley and Hume, *viz.*, as an *image of the external world.* Mach's own theory is subjective idealism; but when the factor of objectivity is required, Mach unceremoniously inserts into his arguments the premises of the contrary, *i.e.*, the materialist, theory of knowledge. Eduard von Hartmann, a consistent idealist and consistent reactionary in philosophy, *who sympathises with the Machian's fight against materialism*, comes very close to the truth when he says that Mach's philosophical position is a "mixture *(Nichtunterscheidung)* of naïve realism and absolute illusionism."[1] That is true. The doctrine that bodies are complexes of sensations, etc., is absolute illusionism, *i.e.*, solipsism; for from this standpoint the world is nothing but my illusion. On the other hand, Mach's aforementioned arguments, as well as many other of his fragmentary arguments, are what is known as "naïve realism," *i.e.*, the materialist theory of knowledge unconsciously and instinctively taken over from the scientists.

Avenarius and the professors who follow in his footsteps attempt to disguise this mixture by the theory of the "principal co-ordination." We shall proceed to examine this theory presently, but let us first finish with the charge that Avenarius is a materialist. Mr. Yushkevich, to whom Wundt's opinion which he failed to understand seemed so interesting, was either himself not enough interested to learn, or else did not condescend to inform the reader, how Avenarius' nearest disciples and successors reacted to this charge. Yet this is necessary to clarify the matter if we are interested in the relation of Marx's philosophy, *i.e.*, materialism, to the philosophy of empirio-criticism. Moreover, if Machism is a muddle, a mixture of materialism and idealism, it is important to know whither this current turned—if we may so express it—after the official idealists began to disown it because of its concessions to materialism.

Wundt was answered, among others, by two of Avenarius' purest and most orthodox disciples, J. Petzoldt and Fr. Carstanjen. Petzoldt, with haughty resentment, repudiated the charge of materialism, which is so degrading to a German professor, and in support referred to—what do you think?—Avenarius' *Prolegomena,* where, forsooth, the concept of substance has been annihilated! A convenient theory, indeed, that can be made to embrace both purely idealist works and arbitrarily assumed materialist premises! Avenarius' *Kritik der reinen Erfahrung,* of course, does not contradict this teaching, *i.e.,* materialism, writes Petzoldt, but neither does it contradict the directly opposite spiritualist doctrine.[1] An excellent defence! This is exactly what Engels called "a pauper's broth of eclecticism." Bogdanov, who refuses to own himself a Machian and who wants to be considered a Marxist *(in philosophy),* follows Petzoldt. He asserts that "empirio-criticism is not . . . concerned with materialism, or with spiritualism, or with metaphysics in general,"[2] that "truth . . . does not lie in the 'golden mean' between the conflicting trends (materialism and spiritualism), but lies outside of both."[3] What appeared to Bogdanov to be truth is, as a matter of fact, confusion, a wavering between materialism and idealism.

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[1] Eduard von Hartmann, *Die Weltanschauung der modernen Physik*, Leipzig, 1902, S. 219.

Carstanjen, rebutting Wundt, said that he absolutely repudiated this "importation *(Unterschiebung)* of a materialist element which is utterly foreign to the critique of pure experience."[4] "Empirio-criticism is scepticism κατ' ἐξοχὴν (pre-eminently) in relation to the content of the concepts." There is a grain of truth in this insistent emphasis on the neutrality of Machism; the amendment made by Mach and Avenarius to their original idealism amounts to an admission of partial concessions to materialism. Instead of the consistent standpoint of Berkeley—the external world is my sensation—we sometimes get the Humean standpoint—I.

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[1] J. Petzoldt, *Einführung in die Philosophie der reinen Erfahrung,* Bd. I, S. 351-52.

[2] Bogdanov, *Empirio-Monism,* Bk. I, 2nd ed., p. 21.

[3] *Ibid.,* p. 93.

[4] Fr. Carstanjen, *"Der Empiriokritizismus, zugleich eine Erwiderung auf W. Wundts Aufsätze," Vierteljahrsschrift für wissenschaftliche Philosophie,* Jahrg. 22 (1898), S. 73 u. 213.

exclude the question whether or not there is anything beyond my sensations. And this agnostic standpoint inevitably condemns one to vacillate between materialism and idealism.

3. THE PRINCIPAL CO-ORDINATION AND "NAÏVE REALISM"

Avenarius' doctrine of the principal co-ordination is expounded in *Der menschliche Weltbegriff* and in the *Bemerkungen.* The second was written later, and in it Avenarius emphasises that he is expounding, it is true in a somewhat altered form, something that is not different from the *Kritik der reinen Erfahrung* and *Der menschliche Weltbegriff,* but *exactly the same* (*Bemerkungen,* 1894, S. 137 in the journal quoted above). The essence of this doctrine is the thesis of "the *indissoluble (unauflösliche)* co-ordination [*i.e.*, the correlative connection] of the self and the environment" (S. 146). "Expressed philosophically," Avenarius says here, one can say the *"self* and *not-self."* We *"always* find together" *(immer ein Zusammenvorgefundenes)* the one and the other, the *self* and the environment. "No full description of what we find *(von Vorgefundenem)* can contain an 'environment' without some self *(ohne ein Ich) whose* environment it is, even though it be only the *self* that is describing what is found *(das Vorgefundene)*" (p. 146). The *self* is called the *central term* of the co-ordination, the environment the *counter-term (Gegenglied). (Cf. Der menschliche Weltbegriff,* 2. Auflage, 1905, S. 83-84, § 148 ff.)

Avenarius claims that by this doctrine he recognises the full value of what is known as *naïve realism,* that is, the ordinary non-philosophical, naïve view which is entertained by all people who do not trouble themselves as to whether they themselves exist and whether the environment, the external world, exists. Expressing his solidarity with Avenarius, Mach also tries to represent himself as a defender of "naïve realism" (*Analyse der Empfindungen,* S. 39). The Russian Machians, without exception, believed Mach's and Avenarius' claim that this was indeed a defence of "naïve realism": the *self* is acknowledged, the environment is acknowledged—what more do you want?

In order to decide who actually possesses the greatest degree of *naïveté,* let us proceed from a somewhat remote starting point. Here is a popular dialogue between a certain philosopher and his reader:

"*Reader:* The existence of a system of things [according to ordinary philosophy] is required and from this only is consciousness to be derived.

"*Author:* Now you are speaking in the spirit of a professional philosopher ... and not according to human common sense and actual consciousness....

"Tell me, and reflect well before you answer: Does a thing appear in you and become present in you and for you otherwise than simultaneously with and through your consciousness of the thing?...

"*Reader:* Upon sufficient reflection, I must grant you this.

"*Author:* Now you are speaking from yourself, from your heart. Take care, therefore, not to jump out of yourself and to apprehend anything otherwise than you are able to apprehend it, as consciousness *and* [the italics are the philosopher's] the thing, the thing *and* consciousness; or, more precisely, neither the one nor the other, but that which only subsequently becomes resolved into the two, that which is the absolute subjective-objective and objective-subjective."

Here you have the whole essence of the empirio-critical principal co-ordination, the latest defence of "naïve realism" by the latest positivism! The idea of "indissoluble" co-ordination is here stated very clearly and as though it were a genuine defence of the point of view of the common man, uncorrupted by the subtleties of "the professional philosophers." But, as a matter of fact, this dialogue is taken from the work of a classical representative of *subjective idealism,* Johann Gottlieb *Fichte, published in 1801.*[1]

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[1] Johann Gottlieb Fichte, *Sonnenklarer Bericht an das größere Publikum über das eigentliche Wesen der neuesten Philosophie. Ein Versuch, die Leser zum Verstehen zu zwingen.* Berlin 1801, S. 178-80.

There is nothing but a paraphrase of subjective idealism in the teachings of Mach and Avenarius we are examining. The claim that they have risen above materialism and idealism, that they have eliminated the opposition between the point of view that proceeds from the thing *to* consciousness and the contrary point of view—is but the empty claim of a renovated Fichteanism. Fichte too imagined that he had "indissolubly" connected the "self" and the "environment," the mind and the thing; that he had "solved" the problem by the assertion that a man cannot jump out of himself. In other words, the Berkeleian argument is repeated: I perceive only my perceptions, I have no right to assume "objects in themselves" outside of my sensation. The different methods of expression used by Berkeley in 1710, by Fichte in 1801, and by Avenarius in 1891-94 do not in the least change the essence of the matter, *viz.*, the fundamental philosophical line of subjective idealism. The world is my sensation; the non-*self* is "postulated" (is created, produced) by the self; the thing is indissolubly connected with the consciousness; the indissoluble co-ordination of the *self* and the environment is the empirio-critical principal co-ordination;—this is all one and the same proposition, the same old trash with a slightly refurbished, or repainted signboard.

The reference to "naïve realism," supposedly defended by this philosophy, is *sophistry* of the cheapest kind. The "naïve realism" of any healthy person who has not been an inmate of a lunatic asylum or a pupil of the idealist philosophers consists in the view that things, the environment, the world, exist *independently* of our sensation, of our consciousness, of our *Self* and of man in general. The same *experience* (not in the Machian sense, but in the human sense of the term) that has produced in us the firm conviction that *independently* of us there exist other people, and not mere complexes of my sensations of high, short, yellow, hard, etc.—this same *experience* produces in us the conviction that things, the world, the environment exist independently of us. Our sensation, our consciousness is only *an image* of the external world, and it is obvious that an image cannot exist without the thing imaged, and that the latter exists independently of that which images it. Materialism *deliberately* makes the "naïve" belief of mankind the foundation of its theory of knowledge.

Is not the foregoing evaluation of the "principal co-ordination" a product of the materialist prejudice against Machism? Not at all. Specialists in philosophy who cannot be accused of partiality towards materialism, who even detest it and who accept one or other of the idealist systems, agree that the principal co-ordination of Avenarius and Co. is subjective idealism. Wundt, for instance, whose interesting opinion was not understood by Mr. Yushkevich, explicitly states that Avenarius' theory, according to which a full description of the given or the found is impossible without some Self, an observer or describer, is "a false confusion of the content of real experience with reflections about it." Natural science, says Wundt, completely abstracts from every observer. "Such abstraction is possible only because the attribution *(Hinzudenken)* of an experiencing individual to every content of experience, which the empirio-critical philosophy, in agreement with the immanentist philosophy, assumes, is an entirely empirical and unfounded assumption arising from a false confusion of the content of real experience with reflections about it" (*loc. cit.*, p. 382). For the immanentists (Schuppe, Rehmke, Leclair, Schubert-Soldern), who themselves voice—as we shall see later—their hearty sympathy with Avenarius, proceed from *this very* idea of the "indissoluble" connection between subject and object. And W. Wundt, before analysing Avenarius, demonstrated in detail that the immanentist philosophy is only a "modification" of Berkeleianism, that however much the immanentists may deny their kinship with Berkeley we should not allow verbal differences to conceal from us the "deeper content of these philosophical doctrines," *viz.*, Berkeleianism or Fichteanism.[1]

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[1] *Loc. cit.*, § C: *Die immanente Philosophie und der Berkeleysche Idealismus*, S. 373 u. 375; vgl. S. 386 u. 407. *Ueber die Unvermeidlichkeit des Solipsismus von diesem Standpunkt*, S. 381.

The English writer Norman Smith, analysing Avenarius' "Philosophy of Pure Experience," puts this criticism in an even more straightforward and emphatic form:

"Most readers of Avenarius' *Der Menschliche Weltbegriff* will probably agree that, however convincing as criticism [of idealism], it is tantalisingly illusive in its positive teaching. So long as we seek to interpret his theory of experience in the form in which it is avowedly presented, namely, as genuinely realistic, it eludes all clear comprehension: its whole meaning seems to be exhausted in negation of the subjectivism which it overthrows. It is only when we translate Avenarius' technical terms into more familiar language that we discover where the real source of the mystification lies. Avenarius has diverted attention from the defects of his position by directing his main attack against the very weakness [*i.e.*, of the idealist position] which is fatal to his own theory."[1] "Throughout the whole discussion the vagueness of the term experience stands him in good stead. Sometimes it means experiencing and at other times the experienced, the latter meaning being emphasised when the nature of the self is in question. These two meanings of the term experience practically coincide with his important distinction between the absolute and the relative standpoints [I have examined above what significance this distinction has for Avenarius]; and these two points of view are not in his philosophy really reconciled. For when he allows as legitimate the demand that experience be ideally completed in thought [the full description of the environment is ideally completed by thinking of an observing self], he makes an admission which he cannot successfully combine with his assertion that nothing exists save in relation to the self. The ideal completion of given reality which results from the analysis of material bodies into elements which no human senses can apprehend, [here are meant the material elements discovered by natural science, the atoms, electrons, etc., and not the fictitious elements invented by Mach and Avenarius] or from following the earth back to a time when no human being existed upon it, is, strictly, not a completion of experience but only of what is experienced. It completes only one of the two aspects which Avenarius has asserted to be inseparable. It leads us not only to what has not been experienced but to what can never by any possibility be experienced by beings like ourselves. But here again the ambiguities of the term experience come to Avenarius' rescue. He argues that thought is as genuine a form of experience as sense-perception, and so in the end falls back on the time-worn argument of subjective idealism, that thought and reality are inseparable, because reality can only be conceived in thought, and thought involves the presence of the thinker. Not, therefore, any original and profound re-establishment of realism, but only the restatement in its crudest form of the familiar position of subjective idealism is the final outcome of Avenarius' positive speculations" (p. 29).

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[1] Norman Smith, "Avenarius' Philosophy of Pure Experience," *Mind*, Vol. XV, 1906, pp. 27-28.

The mystification wrought by Avenarius, who completely duplicates Fichte's error, is here excellently exposed. The much-vaunted elimination of the antithesis between materialism (Norman Smith erroneously uses the term realism) and idealism by means of the term "experience" instantly proves to be a myth as soon as we proceed to definite and concrete problems. Such, for instance, is the problem of the existence of the earth *prior* to man, *prior* to any sentient being. We shall presently speak of this point in detail. Here we will note that not only Norman Smith, an opponent of his theory, but also W. Schuppe, the immanentist, who warmly greeted the appearance of *Der menschliche Weltbegriff* as *a confirmation of naïve realism*[1] unmasks Avenarius and his fictitious "realism." The fact of the matter is that Schuppe *fully* agrees with *such* "realism," *i.e.*, the mystification of materialism dished out by Avenarius. Such "realism," he wrote to Avenarius, I, the immanentist philosopher who have been slandered as a subjective idealist, have always claimed with as much right as yourself, *hochverehrter Herr Kollege*. "My conception of thought . . . excellently harmonises *(verträgt sich vortrefflich)* with your 'pure experience' " (p. 384). "The connection and inseparability of the two terms of the co-ordination" are provided only by the *self* (*das Ich*, the abstract, Fichtean self-consciousness, a thought divorced from the brain). "That which you desired to eliminate you have tacitly assumed"—so Schuppe wrote to Avenarius (p. 388). And it is difficult to say who more rudely unmasks Avenarius the mystifier—Smith by his straightforward and clear refutation, or Schuppe by his enthusiastic opinion of Avenarius' crowning work. The kiss of Wilhelm Schuppe in philosophy is no better than the kiss of Peter Struve or Menshikov[1] in politics.

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[1] See Schuppe's letter to Avenarius in *Vierteljahrsschrift für wissenschaftliche Philosophie*, Bd. XVII, 1893, S. 364-88.

O. Ewald, who praises Mach for not succumbing to materialism, speaks of the principal co-ordination in a similar manner: "If one declares the correlation of central term and counter-term to be an epistemological necessity which cannot be avoided, then, even though the word 'empiriocriticism' be inscribed on the signboard in shrieking letters, one is adopting a standpoint that differs in no way from absolute idealism. [The term is incorrect; he should have said subjective idealism, for Hegel's absolute idealism is reconcilable with the existence of the earth, nature, and the physical universe without man, since nature is regarded as the "otherness" of the absolute idea.] On the other hand, if we do not hold fast to this co-ordination and grant the counter-terms their independence, then the way is at once opened for every metaphysical possibility, especially in the direction of transcendental realism" (*op. cit.*, pp. 56-57).

By metaphysics and transcendental realism, Herr Friedlander, who is disguised under the pseudonym Ewald, means *materialism*. Himself professing one of the varieties of idealism, he fully agrees with the Machians and the Kantians that materialism is metaphysics—"from beginning to end the wildest metaphysics" (p. 134). On the question of the "transcendence" and the metaphysical character of materialism he is in agreement with Bazarov and all our Machians, and of this we shall have occasion to say more later. Here again it is important to note how *in fact* the shallow and pedantic claim to have transcended idealism and materialism vanishes, and how the question arises inexorably and irreconcilably. "To grant the counter-terms their independence" means (if one translates the pretentious language of the affected Avenarius into common parlance) to regard nature and the external world as independent of human consciousness and sensation. And that is materialism. To build a theory of knowledge on the hypothesis of the indissoluble connection between the object and human sensation ("complexes of sensations" as identical with bodies; "world-elements" that are identical both psychically and physically; Avenarius' co-ordination, and so forth) is to land inevitably into idealism. Such is the simple and unavoidable truth that with a little attention may be easily detected beneath the piles of distorted and quasi-erudite terminology of Avenarius, Schuppe, Ewald and the others, which deliberately obscures matters and frightens the general public away from philosophy.

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[1] P. B. Struve, formerly a "legal Marxist," and later a member of the liberal-monarchist Constitutional Democratic Party, at this period had definitely joined the counter-revolutionary camp.

M. O. Menshikov, contributor to the reactionary newspaper *Novoye Vremya*.—*Trans.*

The "reconciliation" of Avenarius' theory with "naïve realism" in the end aroused misgivings even among his own disciples. For instance, R. Willy says that the common assertion that Avenarius came to adopt "naïve realism" should be taken *cum grano salis*. "As a dogma, naïve realism would be nothing but the belief in things-in-themselves existing outside man *(außerpersönliche)* in their perceptible form."[1] In other words, the only theory of knowledge that is really created by an actual and not fictitious agreement with "naïve realism" is, according to Willy, materialism! And Willy, of course, rejects materialism. But he is compelled to admit that Avenarius in *Der menschliche Weltbegriff* restores the unity of "experience," the unity of the "self" and the environment "by means of a series of complicated and extremely artificial subsidiary and intermediary conceptions" (p. 171). *Der menschliche Weltbegriff*, being a reaction against the original idealism of Avenarius, "entirely bears the character of a *reconciliation (eines Ausgleiches)* between the naïve realism of common sense and the epistemological idealism of school philosophy. But that such a reconciliation could restore the unity and integrity of experience [Willy calls it *Grunderfahrung*, that is, a basic experience—another new word!], I would not assert" (p. 170).

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[1] Rudolph Willy, *Gegen die Schulweisheit*, S. 170.

A valuable admission! Avenarius' "experience" failed to reconcile idealism and materialism. Willy, it seems, repudiates the *school philosophy* of experience in order to replace it by a philosophy of "basic" experience, which is confusion thrice confounded....

4. DID NATURE EXIST PRIOR TO MAN?

We have already seen that this question is particularly repugnant to the philosophy of Mach and Avenarius. Natural science positively asserts that the earth once existed in such a state that no man or any other creature existed or could have existed on it. Organic matter is a later phenomenon, the fruit of a long evolution. It follows that there was no sentient matter, no "complexes of sensations," no *self* that was supposedly "indissolubly" connected with the environment in accordance with Avenarius' doctrine. Matter is primary, and thought, consciousness, sensation are products of a very high development. Such is the materialist theory of knowledge, to which natural science instinctively prescribes.

The question arises, have the eminent representatives of empirio-criticism observed this contradiction between their theory and natural science? They have observed it, and they have definitely asked themselves by what arguments this contradiction can be removed. Three attitudes to this question are of particular interest from the point of view of materialism, that of Avenarius himself and those of his disciples J. Petzoldt and R. Willy.

Avenarius tries to eliminate the contradiction to natural science by means of the theory of the "potential" central term in the co-ordination. As we know, co-ordination is the "indissoluble" connection between *self* and environment. In order to eliminate the obvious absurdity of this theory the concept of the "potential" central term is introduced. For instance, what about man's development from the embryo? Does the environment (the "counter-term") exist if the "central term" is represented by an embryo? The embryonic system C—Avenarius replies—is the "potential central term in relation to the future individual environment" (*Bemerkungen,* S. 140). The potential central term is never equal to zero, even when there are as yet no parents *(elterliche Bestandteile)*, but only the "integral parts of the environment" capable of becoming parents (p. 141).

The co-ordination then is indissoluble. It is essential for the empirio-criticist to assert this in order to save the fundamentals of his philosophy—sensations and their complexes. Man is the central term of this co-ordination. But when there is no man, when he has not yet been born, the central term is nevertheless not equal to zero; it has only become a *potential* central term! It is astonishing that there are people who can take seriously a philosopher who advances such arguments! Even Wundt, who stipulates that he is not an enemy of every form of metaphysics (*i.e.,* of fideism), was compelled to admit "the mystical obscuration of the concept experience" by the word "potential," which destroys co-ordination entirely (*op. cit.,* p. 379).

And, indeed, how can one seriously speak of a co-ordination the indissolubility of which consists in one of its terms being potential?

Is this not mysticism, the very antechamber of fideism? If it is possible to think of the potential central term in relation to a future environment, why not think of it in relation to a *past* environment, that is, *after man's death*? You will say that Avenarius did not draw this conclusion from his theory? Granted, but that absurd and reactionary theory became the more cowardly and not any the better for that. Avenarius, in 1894, did not carry this theory to its logical conclusion, or perhaps feared to do so. But R. Schubert-Soldern, as we shall see, resorted in 1896 to *this very theory* to arrive at theological conclusions, which in 1906 earned the *approval* of Mach, who said that Schubert-Soldern was following *"very close paths"* (to Machism).[1] Engels was quite right in attacking Dühring, an avowed atheist, for inconsistently *leaving loopholes* for fideism in his philosophy. Engels several times, and justly, brought this accusation against the materialist Dühring, although the latter had not drawn any theological conclusions, in the 'seventies at least. But we have among us people who would have us regard them as Marxists, yet who bring to the masses a philosophy which comes very close to fideism.

"... It would seem," Avenarius wrote in the *Bemerkungen,* "that from the empirio-critical standpoint natural science is not entitled to enquire about periods of our present environment which in time preceded the existence of man" (S. 144). Avenarius answers: "The enquirer cannot avoid mentally projecting himself" (*sich hinzuzudenken, i.e.,* imagining oneself to be present). For—Avenarius continues —"what the scientist wants (although he may not be clearly aware of it) is essentially only this: how is the earth ... to be defined prior to the appearance of living beings or men if I were mentally to project myself in the role of a spectator—in much the same way as though it were thinkable that we could from our earth follow the history of another star or of another solar system with the help of perfected instruments."

An object cannot exist independently of our consciousness. "We always mentally project ourselves as the intelligence endeavouring to apprehend the object."

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[1] *Analyse der Empfindungen,* S. 4.

This theory of the necessity of "mentally projecting" the human mind to every object and to nature prior to man is given by me in the first paragraph in the words of the "recent positivist," R. Avenarius, and in the second, in the words of the subjective idealist, J. G. Fichte.[1] The sophistry of this theory is so manifest that one feels reluctant to analyse it. If we "mentally project" ourselves, our presence will be *imaginary*—but the existence of the earth prior to man is *real*. Man *could not* in practice be an observer, for instance, of the earth in an incandescent state, and to "imagine" his being present at the time is *obscurantism*, exactly as though I were to endeavour to prove the existence of hell by the argument that if I "mentally projected" myself thither as an observer I could observe hell. The "reconciliation" of empirio-criticism and natural science amounts to this, that Avenarius graciously consents to "mentally project" something the possibility of admitting which is *excluded* by natural science. No man in the least educated or in the least healthy doubts that the earth existed at a time when there *could not* have been any life on it, any sensation or any "central term," and consequently the whole theory of Mach and Avenarius, from which it follows that the earth is a complex of sensations ("bodies are complexes of sensations") or "complexes of elements in which the psychical and physical are identical," or "a counter-term of which the central term can never be equal to zero," is *philosophical obscurantism*, the reduction of subjective idealism to absurdity.

J. Petzoldt perceived the absurdity of the position into which Avenarius had fallen and felt ashamed. In his *Einführung in die Philosophie der reinen Erfahrung* (Vol. II) he devotes a whole paragraph (§ 65) "to the question of the reality of earlier *(frühere)* periods of the earth."

"In the teaching of Avenarius," says Petzoldt, "the self (*das Ich*) plays a role different from that which it plays in the teaching of Schuppe [let us note that Petzoldt openly and repeatedly declares: our philosophy was founded by *three* persons—Avenarius, Mach and Schuppe], yet it is a role which, perhaps, possesses too much importance for his theory." (Petzoldt was evidently influenced by the fact that Schuppe had unmasked Avenarius by showing that with him too everything rests entirely on the *self;* and Petzoldt wishes to make a correction.) "Avenarius said on one occasion," Petzoldt continues, "that we can think of a 'region' where no human foot has yet trodden, but to be able *to think* (italicised by Avenarius) of such an environment there is required 'what we designate by the term self *(Ich-Bezeichnetes), whose* (italicised by Avenarius) thought the thinking is (*V. f. wiss. Ph.,* 18. Bd., 1894, S. 146, Anm.)."

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[1] J. G. Fichte, *Recension des Aenesidemus*, 1794, *Sämtliche Werke*, Bd. I, S. 19.

Petzoldt replies:

"The epistemologically important question, however, is not whether we can think of such a region at all, but whether we are entitled to think of it as existing, or as having existed, independently of any individual mind."

Right is right! People can think and "mentally project" for themselves any kind of hell and any kind of hobgoblin. Lunacharsky even "mentally projected" for himself—well, to use a mild expression—religious conceptions. But it is precisely the purpose of the theory of knowledge to show the unreal, fantastic and reactionary character of such projections.

"... For, that the system C (*i.e.,* the brain) is necessary for thought is obvious both for Avenarius and for the philosophy which is here presented. ..."

That is not true. Avenarius' theory of 1876 is a theory of thought without brain. And even in his theory of 1891-94, as we shall presently see, there is a similar element of idealist nonsense.

"... But is this system C a condition of *existence* [italicised by Petzoldt] of, say, the Mesozoic period of the earth?" And Petzoldt, presenting the argument of Avenarius I have already cited on the subject of what science actually wants and how we can "mentally project" the spectator, objects:

"No, we wish to know whether I have the right to think that the earth at that remote epoch existed in the same way as I think of it as having existed yesterday or a minute ago. Or must the existence of the earth be really made conditional, as Willy claimed, on our right at least to assume that at the given period there co-existed some system C, even though at the lowest stage of its development?" Of this idea of Willy's we shall speak presently.

"Avenarius evades Willy's strange conclusion by the argument that the person who puts the question cannot mentally remove himself (*sich wegdenken, i.e.,* think himself as absent), nor can he avoid mentally projecting himself (*sich hinzuzudenken,* see Avenarius, *Der menschliche Weltbegriff,* S. 130). But then Avenarius makes the individual self of the person who puts the question, or the thought of such a self, the condition not only of the act of thought regarding the uninhabitable earth, but also of the justification for believing in the existence of the earth at that time.

"These false paths are easily avoided if we do not ascribe so much theoretical importance to the self. The only thing the theory of knowledge should demand of the various conceptions of that which is remote in space or time is that it be conceivable and uniquely *(eindeutig)* determined; the rest is the affair of the special sciences" (Vol. II, p. 325).

Petzoldt rechristened the law of causality the law of unique determination and imported into his theory, as we shall see later, the *apriority* of this law. This means that Petzoldt saves himself from Avenarius' subjective idealism and solipsism ("he attributes an exaggerated importance to the self," as the professorial jargon has it) with the help of *Kantian* ideas. The absence of the objective element in Avenarius' doctrine, the impossibility of reconciling it with the demands of natural science, which declares the earth (object) to have existed long before the appearance of living beings (subject), compelled Petzoldt to resort to causality (unique determination). The earth existed, for its existence prior to man is causally connected with the present existence of the earth. Firstly, where does causality come from? *A* *priori,* says Petzoldt. Secondly, are not the ideas of hell, devils, and Lunacharsky's "mental projections" also connected by causality? Thirdly, the theory "of the complexes of sensations" in any case turns out to be destroyed by Petzoldt. Petzoldt failed to resolve the contradiction he observed in Avenarius, and only entangled himself still more, for only one solution is possible, *viz.,* the recognition that the external world reflected by our mind exists independently of our mind. This materialist solution alone is really compatible with natural science, and it alone eliminates both Petzoldt's and Mach's idealist solution of the question of causality, which we shall speak of separately.

The third empirio-criticist, R. Willy, first raised the question of this difficulty in Avenarius' philosophy in 1896, in an article entitled *"Der Empiriokritizismus als einzig wissenschaftlicher Standpunkt"* ("Empirio-criticism as the Only Scientific Standpoint"). What about the world prior to man? —Willy asks here,[1] and at first answers according to Avenarius: "we project ourselves *mentally* into the past." But then he goes on to say that we are not necessarily obliged to regard *experience* as human experience. "For we must simply regard the animal kingdom—be it the most insignificant worm—as primitive fellow-men *(Mitmenschen)* if . . . we regard animal life in connection with general experience" (pp. 73-74). Thus, prior to man the earth was the "experience" of a worm, which discharged the functions of the "central term" in order to save Avenarius' "co-ordination" and Avenarius' philosophy! No wonder Petzoldt tried to dissociate himself from an argument which is not only the height of absurdity (ideas of the earth corresponding to the theories of the geologists attributed to a worm), but which does not in any way help our philosopher, for the earth existed not only before man but before any living being generally.

Willy returned to the question in 1905. The worm was now removed.[1] But Petzoldt's "law of unique determination" could not, of course, satisfy Willy, who regarded it merely as "logical formalism." The author says—will not the question of the world prior to man, as Petzoldt puts it, lead us "back again to the things-in-themselves of common sense"? (*i.e.*, to materialism! How terrible indeed!). What does millions of years without life mean? "Is time perhaps a thing-in-itself? Of course not![2] And that means that things outside men are only impressions, bits of fantasy fabricated by men with the help of a few fragments we find about us. And why not? Need the philosopher fear the stream of life? ... And so I say to myself: abandon all this love of systems and grasp the moment *(ergreife den Augenblick)*, the moment you are living in, the moment which alone brings happiness" (pp. 177-78).

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[1] *Vierteljahrsschrift für wissenschaftliche Philosophie,* Jahrg. XX, 1896, S. 72.

Well, well! Either materialism or solipsism—this, in spite of his vociferous phrases, is what Willy arrives at when he analyses the question of the existence of nature before man.

To summarise. Three augurs of empirio-criticism have appeared before us and have laboured in the sweat of their brow to reconcile their philosophy with natural science, to patch up the holes in their solipsism. Avenarius repeated Fichte's argument and substituted an imaginary world for the real world. Petzoldt withdrew from Fichtean idealism and moved towards Kantian idealism. Willy, having suffered a fiasco with the "worm," threw up the sponge and inadvertently blurted out the truth: either materialism or solipsism, or even the recognition of nothing but the present moment.

It only remains for us to show the reader *how* this problem was understood and treated by our own native Machians. Here is Bazarov in the *Studies "in" the Philosophy of Marxism* (p. 11):

"It remains for us now, under the guidance of our faithful *vademecum* [*i.e.*, Plekhanov], to descend into the last and most horrible circle of the solipsist inferno, into that circle where, as Plekhanov assures us, every subjective idealism is menaced with the necessity of conceiving the world as it was contemplated by the ichthyosauruses and archæopteryxes. 'Let us mentally transport ourselves,' writes Plekhanov, 'to that epoch when only very remote ancestors of man existed on the earth, for instance, to the Mesozoic epoch. The question arises, what was the status of space, time and causality *then*? *Whose* subjective forms were they then? Were they the subjective forms of the ichthyosauruses? And *whose intelligence* at that time dictated its laws to nature? The intelligence of the archæopteryx? To these queries the Kantian philosophy *can give no answer*. And it must be rejected as absolutely incompatible with modern science' (*L. Feuerbach,* p. 117)."

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[1] R. Willy, *Gegen die Schulweisheit*, 1905, S. 173-78.

[2] We shall discuss this point with the Machians later.

Here Bazarov breaks the quotation from Plekhanov just before a very important passage—as we shall soon see—namely: "Idealism says that without subject there is no object. The history of the earth shows that the object existed long before the subject appeared, *i.e.,* long before the appearance of organisms possessing a perceptible degree of consciousness.... The history of development reveals the truth of materialism."

We continue the quotation from Bazarov:

"...But does Plekhanov's thing-in-itself provide the desired solution? Let us remember that even according to Plekhanov we can have no idea of things as they are in themselves; we know only their phenomena, only the results of their actions on our sense-organs. Apart from this action they possess no aspect (*L. Feuerbach,* p. 112). What sense-organs existed in the period of the ichthyosauruses? Evidently, only the sense-organs of the ichthyosauruses and their like. Only the ideas of the ichthyosauruses were then the actual, the real manifestations of things-in-themselves. Hence, according to Plekhanov, also if the paleontologist desires to remain on 'real' ground he must write the story of the Mesozoic epoch in the light of the contemplations of the ichthyosaurus. And, consequently, not a single step forward is made in comparison with solipsism."

Such is the complete argument (the reader must pardon the lengthy quotation—we could not avoid it) of a Machian, an argument worthy of perpetuation as a first-class example of muddleheadedness.

Bazarov imagines that Plekhanov gave himself away. If things-in-themselves, apart from their action on our sense-organs, have no aspect of their own, then in the Mesozoic epoch they did not exist except as the "aspect" of the sense-organs of the ichthyosaurus. And this is the argument of a materialist! If an "aspect" is the result of the action of "things-in-themselves" on sense-organs—it follows that things *do not exist independently* of sense-organs of one kind or another!

Let us assume for a moment that Bazarov indeed "misunderstood" Plekhanov's words (improbable as such an assumption may seem), that they did appear obscure to him. Be it so. We ask: is Bazarov engaged in a fencing bout with Plekhanov (whom the Machians exalt to the position of the only representative of materialism!), or is he endeavouring to clear up the problem *of materialism*? If Plekhanov seemed obscure to you, or contradictory, and so forth, why did you not turn to other materialists? Is it because you do not know them? But ignorance is no argument.

If Bazarov indeed does not know that the fundamental premise of materialism is the recognition of the external world, of the existence of *things* outside and independent of our mind, this is truly a striking case of crass ignorance. We would remind the reader of Berkeley, who in 1710 rebuked the materialists for their recognition of "objects in themselves" existing independently of our mind and reflected by our mind. Of course, everybody is free to side with Berkeley or anyone else *against* the materialists; that is unquestionable. But it is equally unquestionable that to speak of the materialists and distort or ignore the fundamental premise of *all* materialism is to import preposterous confusion into the problem.

Was Plekhanov right when he said that for idealism there is no object without a subject, while for materialism the object exists independently of the subject and is reflected more or less adequately in the subject's mind? If this is *wrong,* then any man who has the slightest respect for Marxism should have pointed out *this* error of Plekhanov's, and should have dealt *not* with him, but with someone else, with Marx, Engels, or Feuerbach, on the question of materialism and the existence of nature prior to man. But if this is right, or, at least, if you are unable to find an error here, then your attempt to shuffle the cards and to confuse in the reader's mind the most elementary conception of materialism, as distinguished from idealism, is a literary indecency.

As for the Marxists who are interested in the question *apart* from every little word uttered by Plekhanov, we shall quote the opinion of L. Feuerbach, who as is known (perhaps *not* to Bazarov?), was a materialist, and through whom Marx and Engels, as is well known, came from the idealism of Hegel to their materialist philosophy. In his rejoinder to R. Haym, Feuerbach wrote:

"Nature, which is not an object of man or mind, is for speculative philosophy, or at least for idealism, a Kantian thing-in-itself [we shall speak later in detail of the fact that our Machians confuse the Kantian thing-in-itself with the materialist thing-in-itself], an abstraction without reality, but it is nature that causes the downfall of idealism. Natural science, at least in its present state, necessarily leads us back to a point when the conditions for human existence were still absent, when nature, *i.e.,* the earth, was not yet an object of the human eye and mind, when, consequently, nature was an absolutely non-human entity *(absolut unmenschliches Wesen).* Idealism may retort: but nature also is something thought of by you *(von dir gedachte).* Certainly, but from this it does not follow that this nature did not at one time actually exist, just as from the fact that Socrates and Plato do not exist for me if I do not think of them, it does not follow that Socrates and Plato did not actually at one time exist without me."[1]

This is how Feuerbach regarded materialism and idealism from the standpoint of the existence of nature prior to the appearance of man. Avenarius' sophistry (the "mental projection of the observer") was refuted by Feuerbach, who did not know the "recent positivism" but who thoroughly knew the old idealist sophistry. And Bazarov offers us absolutely nothing new, but merely repeats this sophistry of the idealists: "Had I been there [on earth, prior to man], I would have seen the world so-and-so" (*Studies "in" the Philosophy of Marxism,* p. 29). In other words: if I make an assumption that is obviously absurd and contrary to natural science (that man can be an observer in an epoch before man existed), I shall be able to patch up the breach in my philosophy!

This gives us an idea of the extent of Bazarov's knowledge of the subject and of his literary methods. Bazarov did not even hint at the "difficulty" with which Avenarius, Petzoldt and Willy wrestled; and, moreover, he made such a hash of the whole subject, placed before the reader such an incredible hotchpotch, that there ultimately appears to be no difference between materialism and solipsism! Idealism is represented as "realism," and to materialism is ascribed the denial of the existence of things outside of their action on the sense-organs! Truly, either Feuerbach did not know the elementary difference between materialism and idealism, or else Bazarov and Co. have completely altered the elementary truths of philosophy.

Or let us take Valentinov, a philosopher who, naturally, is delighted with Bazarov: 1) "Berkeley is the founder of the correlativist theory of the relativity of subject and object" (p. 148). This is not Berkeleian idealism, oh, no! This is a

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[1] Ludwig Feuerbach, *Sämtliche Werke,* herausgegeben von W. Bolin und Fr. Jodl, Bd. VII, Stuttgart 1903, S. 510; or Karl Grün, *L. Feuerbach in seinem Briefwechsel und Nachlaß, sowie in seiner philosophischen Charakterentwicklung,* Bd. I, Leipzig 1874, S. 423-35.

"profound analysis." 2) "In the most realistic aspect, irrespective of the forms [!] of their usual idealist interpretation [only interpretation!], the fundamental premises of the theory are formulated by Avenarius" (p. 148). Infants, as we see, are taken in by the hocus pocus! 3) "His [Avenarius'] conception of the starting point of knowledge is that each individual finds himself in a definite environment, in other words, the individual and the environment are represented as connected and inseparable [!] terms of one and the same co-ordination" (p. 148). Delightful! This is not idealism—Bazarov and Valentinov have risen above materialism and idealism—this "inseparability" of the subject and object is "realism" itself. 4) "Is the reverse assertion correct, namely, that there is no counter-term to which there is no corresponding central term—an individual? Naturally [!] not.... In the archaic period the woods were verdant ... yet there was no man" (p. 148). That means that the inseparable *can* be separated! Is that not "natural"? 5) "Yet from the standpoint of the theory of knowledge, the question of the object in itself is absurd" (p. 148). Of course! When there were no sentient organisms objects were nevertheless "complexes of elements" *identical* with sensations! 6) "The immanentist school, in the person of Schubert-Soldern and Schuppe, clad these [!] thoughts in an unsatisfactory form and found itself in the *cul-de-sac* of solipsism" (p. 149). But "these thoughts" themselves, of course, contain no solipsism, and empirio-criticism, of course, is not a paraphrase of the reactionary theories of the immanentists, who lie when they declare themselves to be in sympathy with Avenarius!

This, Messrs. Machians, is not philosophy, but an incoherent jumble of words.

5. DOES MAN THINK WITH THE HELP OF THE BRAIN?

Bazarov emphatically answers this question in the affirmative. He writes: "If Plekhanov's thesis that 'consciousness is an internal [? Bazarov] state of matter' be given a more satisfactory form, *e.g.*, that 'every psychical process is a function of the cerebral process,' then neither Mach nor Avenarius would dispute it" (*Studies "in" the Philosophy of Marxism*, p. 29).

To the mouse no beast is stronger than the cat. To the Russian Machians there is no materialist stronger than Plekhanov. Was Plekhanov really the *only* one, or the first, to advance the materialist thesis that consciousness is an internal state of matter? And if Bazarov did not like Plekhanov's formulation of materialism, why did he take Plekhanov and not Engels or Feuerbach?

Because the Machians are afraid to admit the truth. They are fighting materialism, but pretend that it is only Plekhanov they are fighting. A cowardly and unprincipled method.

But let us turn to empirio-criticism. Avenarius "would not dispute" the statement that thought is a function of the brain. These words of Bazarov's contain a direct untruth. Not only does Avenarius *dispute* the materialist thesis, but invents a whole "theory" in order to refute it. "The brain," says Avenarius in *Der menschliche Weltbegriff*, "is not the habitation, the seat, the creator, it is not the instrument or organ, the supporter or substratum, etc., of thought" (p. 76—approvingly quoted by Mach in the *Analyse der Empfindungen*, p. 22, note). "Thought is not an indweller, or commander, or the other half, or side, etc., nor is it a product or even a physiological function, or a state in general of the brain" (*ibid.*). And Avenarius expresses himself no less emphatically in his *Bemerkungen:* "presentations" are "not functions (physiological, psychical, or psycho-physical) of the brain" (*op. cit.*, § 115). Sensations are not "psychical functions of the brain" (§ 116).

Thus, according to Avenarius, the brain is not the organ of thought, and thought is not a function of the brain. Take Engels, and we immediately find directly contrary, frankly materialist formulations. "Thought and consciousness," says Engels in *Anti-Dühring*, "are products of the human brain."[1]

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[1] See *Anti-Dühring*, English ed., 1935, p. 44.—*Trans.*

This idea is often repeated in that work. In *Ludwig Feuerbach* we have the following exposition of the views of Feuerbach and Engels: "... the material *(stofflich)*, sensuously perceptible world to which we ourselves belong is the only reality ... our consciousness and thinking, however suprasensuous they may seem, are the product *(Erzeugnis)* of a material, bodily organ, the brain. Matter is not a product of mind, but mind itself is merely the highest product of matter. This is, of course, pure materialism" (4th German ed., p. 18).[1] Or on p. 4, where he speaks of the reflection of the processes of nature in "the thinking brain," etc., etc.

Avenarius rejects this materialist standpoint and says that "the thinking brain" is a *"fetish of natural science" (Der menschliche Weltbegriff,* 2. Aufl., S. 70). Hence, Avenarius cherishes no illusions concerning his absolute disagreement with natural science on this point. He admits, as do Mach and all the immanentists, that natural science holds an instinctive and unconscious materialist point of view. He admits and explicitly declares that *he absolutely differs from the "prevailing psychology" (Bemerkungen,* S. 150, etc.). This prevailing psychology is guilty of an inadmissible "introjection"—such is the new term contrived by our philosopher—*i.e.*, the insertion of thought into the brain, or of sensations into us. These "two words" (into us—*in uns*), Avenarius goes on to say, contain the assumption *(Annahme)* that empirio-criticism disputes. "This *insertion (Hineinverlegung)* of the visible, etc., into man is what we call *introjection*" (p. 153, § 45).

Introjection deviates "in principle" from the "natural conception of the world" *(natürlicher Weltbegriff)* by substituting "into me" for "before me" (*vor mir,* p. 154) "by turning a component part of the (real) environment into a component part of (ideal) thought" *(ibid.)*. "Out of the *amechanical* [a new word in place of "psychical"] which manifests itself freely and clearly in the experienced [or, in what is found—*im Vorgefundenen*], introjection makes something which hides itself [*Latitierendes,* says Avenarius—another new word] mysteriously in the central nervous system" *(ibid.).*

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[1] F. Engels, *Ludwig Feuerbach,* English ed., 1934, p. 35.—*Trans.*

Here we have the same *mystification* that we encountered in the famous defence of "naïve realism" by the empirio-criticists and immanentists. Avenarius here acts on the advice of the charlatan in Turgenev: denounce most of all those vices which you yourself possess. Avenarius tries to pretend that he is combating idealism: philosophical idealism, you see, is usually deduced from introjection, the external world is converted into sensation, into ideas, and so forth, while I defend "naïve realism," the equal reality of everything presented, both *"self"* and environment, without inserting the external world into the human brain.

The sophistry here is the same as that which we observed in the case of the famous co-ordination. While distracting the attention of the reader by attacking idealism, Avenarius is in fact defending idealism, albeit in slightly different words: thought is not a function of the brain; the brain is not the organ of thought; sensations are not functions of the nervous system, oh, no! sensations are—"elements," psychical only in one connection, while in another connection (although the elements are *"identical"*) they are physical. With his new and muddled terminology, with his new and pompous epithets, supposedly expressing a new "theory," Avenarius merely beat about the bush and returned to his fundamental idealist premise.

And if our Russian Machians (*e.g.*, Bogdanov) failed to notice the "mystification" and discerned a refutation of idealism in the "new" defence of idealism, in the analysis of empirio-criticism given by the philosophical experts we find a sober estimate of the true nature of Avenarius' ideas, which is laid bare when stripped of its pretentious terminology.

In 1903 Bogdanov wrote:[1]

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[1] A. Bogdanov, "Authoritative Thinking," an article in the symposium *From the Psychology of Society,* p. 119, *et seq.*

"Richard Avenarius presented a most harmonious and complete philosophical picture of the development of the dualism of spirit and body. The gist of his 'doctrine of introjection' is the following: [we observe only physical bodies directly, and we infer the experiences of others, *i.e.,* the mind of another person, only by hypothesis].... The hypothesis is complicated by the fact that the experiences of the other person are located within his body, are inserted (introjected) into his organism. This is already a superfluous hypothesis and even gives rise to numerous contradictions. Avenarius systematically draws attention to these contradictions by unfolding a series of successive historical facts in the development of dualism and of philosophical idealism. But here we need not follow Avenarius.... Introjection serves as an explanation of the dualism of mind and body."

Bogdanov swallowed the bait of professorial philosophy in believing that "introjection" was aimed against idealism. He accepted the evaluation of introjection given by Avenarius himself *at its face value* and failed to notice the *barb* directed against materialism. Introjection denies that thought is a function of the brain, that sensations are functions of man's central nervous system: that is, it denies the most elementary truth of physiology in order to destroy materialism. "Dualism," it appears, is refuted *idealistically* (notwithstanding all Avenarius' diplomatic rage against idealism), for sensation and thought prove to be not secondary, not a product of matter, but *primary.* Dualism is here refuted by Avenarius only in so far as he "refutes" the existence of the object without the subject, matter without thought, the external world independent of our sensations; that is, it is refuted *idealistically.* The absurd denial of the fact that the visual image of a tree is a function of the retina, the nerves and the brain, was required by Avenarius in order to bolster up his theory of the "indissoluble" connection of the "complete" experience, which includes not only the self but also the tree, *i.e.,* the environment.

The doctrine of introjection is a muddle; it smuggles in idealistic rubbish and is contradictory to natural science, which inflexibly holds that thought is a function of the brain, that sensations, *i.e.*, the images of the *external world*, exist *within us*, produced by the action of things on our sense-organs. The materialist elimination of the "dualism of spirit and body" (*i.e.*, materialist monism) consists in the assertion that the spirit does not exist independently of the body, that spirit is secondary, a function of the brain, a reflection of the external world. The idealist elimination of the "dualism of spirit and body" (*i.e.*, idealist monism) consists in the assertion that spirit *is not* a function of the body, that, consequently, spirit is primary, that the "environment" and the "self" exist only in an inseparable connection of one and the same "complexes of elements." Apart from these two diametrically opposed methods of eliminating "the dualism of spirit and body," there can be no third method, unless it be eclecticism, which is a senseless jumble of materialism and idealism. And it was this jumble of Avenarius' that seemed to Bogdanov and Co. "the truth transcending materialism and idealism."

But the professional philosophers are not as naïve and credulous as are the Russian Machians. True, each of these professors-in-ordinary advocates his *"own"* system of refuting materialism, or, at any rate, of "reconciling" materialism and idealism. But when it comes to a competitor they unceremoniously expose the unconnected fragments of materialism and idealism that are contained in all the "recent" and "original" systems. And if a few young intellectuals swallowed Avenarius' bait, that old bird Wundt was not to be enticed so easily. The idealist Wundt tore the mask from the poseur Avenarius very unceremoniously *when he praised him for the anti-materialist tendency of the theory of introjection.*

"If empirio-criticism," Wundt wrote, "reproaches vulgar materialism because by such expressions as the brain 'has' thought, or the brain 'produces' thought, it expresses a relation which generally cannot be established by factual observation and description [evidently, for Wundt it is a "fact" that a person thinks without the help of a brain!] ... this reproach, of course, is well founded" (*op. cit.*, pp. 47-48).

Well, of course! The idealists will always join the half-hearted Avenarius and Mach in attacking materialism! It is only a pity, Wundt goes on to say, that this theory of introjection "does not stand in any relation to the doctrine of the independent vital series, and was, to all appearances, only tacked on to it as an afterthought and in a rather artificial fashion" (p. 365).

Introjection, says O. Ewald, "is to be regarded as nothing but a fiction of empirio-criticism, which the latter requires in order to shield its own fallacies" (*op. cit.*, p. 44). "We observe a strange contradiction: on the one hand, the elimination of introjection and the restoration of the natural world conception is intended to restore to the world the character of living reality; on the other hand, in the principal co-ordination empirio-criticism is leading to a purely idealist theory of an absolute correlation of the counter-term and the central term. Avenarius is thus moving in a circle. He set out to do battle against idealism but laid down his arms before it came to an open skirmish. He wanted to liberate the world of objects from the yoke of the subject, but again bound that world to the subject. What he has actually destroyed by his criticism is a caricature of idealism rather than its genuine epistemological expression" (*ibid.*, pp. 64-65).

"In his [Avenarius'] frequently quoted statement," Norman Smith says, "that the brain is not the seat, organ or supporter of thought, he rejects the only terms which we possess for defining their connection" (*op. cit.*, p. 30).

Nor is it surprising that the theory of introjection approved by Wundt appeals to the sympathy of the outspoken spiritualist, James Ward,[1] who wages systematic war on "naturalism and agnosticism," and especially on Huxley (not because he was an insufficiently outspoken and determined materialist, for which Engels reproached him, but) because his agnosticism served in fact to conceal materialism.

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[1] James Ward, *Naturalism and Agnosticism*, London, 1906, Vol. II, pp. 171-72.

Let us note that Karl Pearson, the English Machian, who avoids all philosophical artifices, and who recognises neither introjection, nor co-ordination, nor yet "the discovery of the world-elements," arrives at the inevitable outcome of Machism when it is stripped of such "disguises," namely, pure subjective idealism. Pearson knows no "elements"; "sense impressions" are his alpha and omega. He never doubts that man thinks with the help of the brain. And the contradiction between this thesis (which alone conforms with science) and the basis of his philosophy remains naked and obvious. Pearson spares no effort in combating the concept that matter exists independently of our sense-impressions (*The Grammar of Science*, Chap. VII). Repeating all Berkeley's arguments, Pearson declares that matter is a nonentity. But when he comes to speak of the relation of the brain to thought, Pearson emphatically declares: "From will and consciousness associated with material machinery we can infer nothing whatever as to will and consciousness without that machinery."[1] He even advances the following thesis as a summary of his investigations in this field: "Consciousness has no meaning beyond nervous systems akin to our own; it is illogical to assert that all matter is conscious [but it is logical to assert that all matter possesses a property which is essentially akin to sensation, the property of reflection], still more that consciousness or will can exist outside matter" (*ibid.*, p. 75, 2nd thesis). Pearson's muddle is glaring! Matter is nothing but groups of sense-impressions. That is his premise, that is his philosophy. Hence, sensation and thought should be primary; matter, secondary. But no, consciousness without matter does not exist, and apparently not even without a nervous system! That is, consciousness and sensation are secondary. The waters rest on the earth, the earth rests on a whale, and the whale rests on the waters. Mach's "elements" and Avenarius' co-ordination and introjection do not clear up this muddle; all they do is to cover up traces with the help of an erudite philosophical gibberish.

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[1] Karl Pearson, *The Grammar of Science*, 2nd ed., London, 1900, p. 58.

Just such gibberish, and of this a word or two will suffice, is the terminology of Avenarius, who coined a plenitude of diverse "notals," "securals," "fidentials," etc., etc. Our Russian Machians for the most part shamefacedly avoid this professorial nonsense, and only now and again bombard the reader (in order to stun him) with an "existential" and such like. But if naïve people take these words for a special species of bio-mechanics, the German philosophers, who are themselves lovers of "erudite" words, laugh at Avenarius. To say "notal" (*notus*=known), or to say that this or the other thing is known to me, is absolutely one and the same, says Wundt in the section entitled *"Scholastischer Charakter des empiriokritischen Systems."* And, indeed, it is the purest and most dreary scholasticism. One of Avenarius' faithful disciples, R. Willy, had the courage to admit it. "Avenarius dreamed of a bio-mechanics," says he, "... but an understanding of the life of the brain can be arrived at only by actual discoveries ... and not by the way in which Avenarius attempted to arrive at it. Avenarius' bio-mechanics is not grounded on any new observations whatever; its characteristic feature is purely schematic constructions of concepts, and, indeed, constructions that do not even bear the nature of hypotheses that open up new vistas, but rather of stereotyped speculations *(bloßen Spekulierschablonen)*, which, like a wall, conceal our view."[1]

The Russian Machians will soon be like fashion-lovers who are moved to ecstasy over a hat which has already been discarded by the bourgeois philosophers of Europe.

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[1] R. Willy, *Gegen die Schulweisheit*, p. 169. Of course, the pedant Petzoldt will not make any such admissions. With the smug satisfaction of the philistine he chews the cud of Avenarius' "biological" scholasticism (Vol. I, Chap. II).

6. THE SOLIPSISM OF MACH AND AVENARIUS

We have seen that the starting point and the fundamental premise of the philosophy of empirio-criticism is subjective idealism. The world is our sensation—this is the fundamental premise, which is obscured but in nowise altered by the word "element" and by the theories of the "independent series," "co-ordination," and "introjection." The absurdity of this philosophy lies in the fact that it leads to solipsism, to the recognition of the existence of the philosophising individual only. But our Russian Machians assure their readers that to "charge" Mach "with idealism and even solipsism" is "extreme subjectivism." So says Bogdanov in the introduction to the Russian translation of *Analyse der Empfindungen* (p. xi), and the whole Machian troop repeat it in a great variety of keys.

Having examined the methods whereby Mach and Avenarius disguise their solipsism, we have now to add only one thing: the "extreme subjectivism" of assertion lies entirely with Bogdanov and Co.; for in philosophical literature writers of the most varied trends have long since disclosed the fundamental sin of Machism beneath all its disguises. We shall confine ourselves to a mere *summary* of opinions which sufficiently indicate the "subjective" *ignorance* of our Machians. Let us note in passing that nearly every professional philosopher sympathises with one or another brand of idealism: in their eyes idealism is not a reproach, as it is with us Marxists; but they point out Mach's *actual* philosophical trend and oppose one system of idealism by another system, also idealist, but to them more consistent.

O. Ewald, in a book devoted to an analysis of Avenarius' teachings, writes: "The creator of empirio-criticism commits himself *volens nolens* to solipsism" (*loc. cit.*, pp. 61-62).

Hans Kleinpeter, a disciple of Mach with whom Mach in his preface to *Erkenntnis und Irrtum* explicitly declares his solidarity, says: "It is precisely Mach who is an example of the compatibility of epistemological idealism with the demands of natural science [for the eclectic everything is compatible], and of the fact that the latter can very well start from solipsism without stopping there" (*Archiv für systematische Philosophie,* 1900, Bd. VI, S. 87).

E. Lucka, analysing Mach's *Analyse der Empfindungen,* says: "Apart from this ... misunderstanding *(Mißverständnis)* Mach adopts the ground of pure idealism.... It is incomprehensible that Mach denies that he is a Berkeleian" (*Kantstudien,* Bd. VIII, 1903, S. 416-17).

W. Jerusalem, a most reactionary Kantian with whom Mach in the above-mentioned preface expresses his solidarity ("a closer kinship" of thought than Mach had previously suspected—*Vorwort zu "Erkenntnis und Irrtum,"* S. X, 1906), says: "Consistent phenomenalism leads to solipsism." And therefore one must borrow a little from Kant! (See *Der kritische Idealismus und die reine Logik,* Wien, 1905, S. 26.)

R. Hönigswald says: "... the immanentists and the empirio-criticists face the alternative of solipsism or metaphysics in the spirit of Fichte, Schelling, or Hegel" (*Ueber die Lehre Humes von der Realität der Außendinge,* 1904, S. 68).

The English physicist Oliver Lodge, in his book denouncing the materialist Haeckel, speaks in passing, as though of something generally known, of "solipsists such as Mach and Karl Pearson" (*Life and Matter,* 1906, p. 8).

Nature, the organ of the English scientists, through the mouth of the geometrician E. T. Dixon, pronounced a very definite opinion of the Machian Pearson, one worth quoting, not because it is new, but because the Russian Machians have naïvely accepted Mach's philosophical muddle as the "philosophy of natural science" (A Bogdanov, introduction to *Analyse der Empfindungen,* p. xii, *et seq.*).

"The foundation of the whole book," Dixon writes, "is the proposition that since we cannot directly apprehend anything but sense-impressions, therefore the things we commonly speak of as objective, or external to ourselves, and their variations, are nothing but groups of sense-impressions and sequences of such groups. But Professor Pearson admits the existence of other consciousness than his own, not only by implication in addressing his book to them, but explicitly in many passages." Pearson infers the existence of the consciousness of others by analogy, by observing the bodily motions of other people; but since the consciousness of others is real, the existence of people outside myself must be granted! "Of course it would be impossible thus to refute a consistent idealist, who maintained that not only external things but all other consciousness were unreal and existed only in his imagination; but to recognise the reality of other consciousnesses is to recognise the reality of the means by which we become aware of them, which ... is the external aspect of men's bodies." The way out of the difficulty is to recognise the "hypothesis" that to our sense-impressions there corresponds an objective reality outside of us. This hypothesis satisfactorily explains our sense-impressions. "I cannot seriously doubt that Professor Pearson himself believes in them as much as anyone else. Only, if he were to acknowledge it explicitly, he would have to rewrite almost every page of *The Grammar of Science*."[1]

Ridicule—that is the response of the thinking scientists to the idealist philosophy over which Mach waxes so enthusiastic.

And here, finally, is the opinion of a German physicist, L. Boltzmann. The Machians will perhaps say, as Friedrich Adler said, that he is a physicist of the old school. But we are concerned *now* not with theories of physics but with a fundamental philosophical problem. Writing against people who "have been carried away by the new epistemological dogmas," Boltzmann says: "Mistrust of conceptions which we can derive only from immediate sense-impressions has led to an extreme which is the direct opposite of former naïve belief. Only sense-impressions are given us, and, therefore, it is said, we have no right to go a step beyond. But to be consistent, one must further ask: are our sense-impressions of yesterday also given? What is immediately given is only the one sense-impression, or only the one thought, namely, the one we are thinking of at the present moment. Hence, to be consistent, one would have to deny not only the existence of other people outside one's self, but also all conceptions we ever had in the past."[1]

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[1] *Nature*, July 21, 1892, pp. 268-69.

This physicist rightly regards the supposedly "new" "phenomenalist" view of Mach and Co. as the old absurdity of philosophical subjective idealism

No, it is those who "failed to note" that solipsism is Mach's fundamental error who are stricken with "subjective" blindness.

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[1] Ludwig Boltzmann, *Populäre Schriften,* Leipzig, 1905, S. 132. Vgl. S. 168, 177, 187, etc.

CHAPTER TWO

THE THEORY OF KNOWLEDGE OF EMPIRIO-CRITICISM AND OF DIALECTICAL MATERIALISM. II

1. THE "THING-IN-ITSELF," OR V. CHERNOV REFUTES FREDERICK ENGELS

Our Machians have written so much about the "thing-in-itself" that were all their writings to be collected they would result in mountains of printed matter. The "thing-in-itself" is a veritable *bête noir* with Bogdanov, Valentinov, Bazarov, Chernov, Berman and Yushkevich. There is no abuse they have not hurled at it, there is no ridicule they have not showered on it. And against whom are they breaking lances because of this luckless "thing-in-itself"? Here a division of the philosophers of Russian Machism according to political parties begins. All the would-be Marxists among the Machians are combating *Plekhanov's* "thing-in-itself"; they accuse Plekhanov of having become entangled and of having strayed into Kantianism, of having forsaken Engels. (We shall discuss the first accusation in the fourth chapter; the second accusation we shall deal with now.) The Machian Mr. Victor Chernov, a Narodnik and a sworn enemy of Marxism, opens a direct campaign *against Engels* because of the "thing-in-itself."

One is ashamed to confess it, but it would be a sin to conceal the fact that on this occasion open enmity towards Marxism has made Mr. Victor Chernov a *more* principled literary antagonist than our comrades in party and opponents in philosophy. For only a *guilty conscience* (and in addition, perhaps, ignorance of materialism?) could have been responsible for the fact that the Machian would-be Marxists have diplomatically set Engels aside, have completely ignored Feuerbach and are circling exclusively around Plekhanov. It is indeed circling around one spot, tedious and petty pecking and cavilling at a disciple of Engels, while a frank examination of the views of the teacher himself is cravenly avoided. And since the purpose of these cursory comments is to disclose the reactionary character of Machism and the correctness of the materialism of Marx and Engels, we shall leave aside the fussing of the Machian would-be Marxists with Plekhanov and turn directly to Engels, whom the empirio-criticist Mr. V. Chernov refuted. In his *Philosophical and Sociological Studies* (Moscow, 1907—a collection of articles written, with few exceptions, before 1900) the article "Marxism and Transcendental Philosophy" bluntly begins with an attempt to set up Marx against Engels and accuses the latter of "naïve dogmatic materialism," of "the crudest materialist dogmatism" (pp. 29 and 32). Mr. V. Chernov states that a "sufficient" example of this is Engels' argument against the Kantian thing-in-itself and Hume's philosophical line. We shall begin with this argument.

In his *Ludwig Feuerbach,* Engels declares that the fundamental philosophical trends are materialism and idealism. Materialism regards nature as primary and spirit as secondary; it places being first and thought second. Idealism holds the contrary view. This root distinction between the "two great camps" into which the philosophers of the "various schools" of idealism and materialism are divided Engels takes as the cornerstone, and he directly charges with "confusion" those who use the terms idealism and materialism in any other way.

"The great basic question of all philosophy," Engels says, "especially of modern philosophy, is that concerning the relation of thinking and being," of spirit and nature. Having divided the philosophers into "two great camps" on this basic question, Engels shows that there is "yet another side" to this basic philosophical question, *viz.*, "in what relation do our thoughts about the world surrounding us stand to this world itself? Is our thinking capable of the cognition of the real world? Are we able in our ideas and notions of the real world, to produce a correct reflection of reality?"[1]

"The overwhelming majority of philosophers give an affirmative answer to this question," says Engels, including under this head not only the materialists but also the most consistent idealists, as, for example, the absolute idealist Hegel, who considered the real world to be the realisation of some pre-mundane "absolute idea," while the human spirit, correctly apprehending the real world, apprehends in it and through it the "absolute idea."

"In addition [*i.e.*, to the materialists and the consistent idealists] there is yet another set of different philosophers—those who question the possibility of any cognition (or at least of an exhaustive cognition) of the world. To them, among the moderns, belong Hume and Kant, and they have played a very important role in philosophical development. . . ." (P. 32.)

Mr. V. Chernov, quoting these words of Engels', launches into the fray. To the word "Kant" he makes the following annotation:

"In 1888 it was rather strange to term such philosophers as Kant and especially Hume as 'modern.' At that time it was more natural to hear mentioned such names as Cohen, Lange, Riehl, Laas, Liebmann, Göring, etc. But Engels, evidently, was not well versed in 'modern' philosophy" (*op. cit.*, p. 33, note 2).

Mr. V. Chernov is true to himself. Equally in economic and philosophical questions he reminds one of Turgenev's

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[1] F. Engels, *Ludwig Feuerbach* (quoted from the English edition, 1934, pp. 30-31.—*Trans.*) Mr. V. Chernov translates the word *Spiegelbild* literally (a mirror reflection), accusing Plekhanov of presenting the theory of Engels *"in a very weakened form"* by speaking in Russian simply of a "reflection" instead of a "mirror reflection." This is mere cavilling. *Spiegelbild* in German is also used simply in the sense of *Abbild* (reflection, image.—*Trans.*).

Voroshilov,[1] annihilating both the ignorant Kautsky[2] and the ignorant Engels by merely referring to "scholarly" names! The only trouble is that all the authorities mentioned by Mr. Chernov are the very *Neo-Kantians* whom Engels refers to *on this very same page* of his *Ludwig Feuerbach* as theoretical *reactionaries,* who were endeavouring to resurrect the corpse of the long since refuted doctrines of Kant and Hume. The good Chernov did not understand that it is *just these authoritative* (for Machism) and muddled professors whom Engels is refuting in his argument!

Having pointed out that Hegel had already presented the "decisive" arguments against Hume and Kant, and that the additions made by Feuerbach are more ingenious than profound, Engels continues:

"The most telling refutation of this as of all other philosophical fancies *(Schrullen)* is practice, *viz.*, experiment and industry. If we are able to prove the correctness of our conception of a natural process by making it ourselves, bringing it into being out of its conditions and using it for our own purposes into the bargain, then there is an end of the Kantian incomprehensible [or ungraspable, *unfaßbaren*—this important word is omitted both in Plekhanov's translation and in Mr. V. Chernov's translation] 'thing-in-itself.' The chemical substances produced in the bodies of plants and animals remained just such 'things-in-themselves' until organic chemistry began to produce them one after another, whereupon the 'thing-in-itself' became a thing for us, as, for instance, alizarin, the colouring matter of the madder, which we no longer trouble to grow in the madder roots in the field, but produce much more cheaply and simply from coal tar" (pp. 32-33).

Mr. V. Chernov, quoting this argument, finally loses patience and completely annihilates poor Engels. Listen to this: "No Neo-Kantian will of course be surprised that from coal tar we can produce alizarin 'more cheaply and simply.' But that together with alizarin it is possible to produce from this coal tar and just as cheaply a refutation of the 'thing-in-itself' will indeed seem a wonderful and unprecedented discovery—and not to the Neo-Kantians alone.

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[1] In the novel *Smoke.—Trans.*

[2] V. Ilyin, *The Agrarian Question*, Part I, St. Petersburg, 1908. (See Lenin, *Selected Works,* Vol. I, English ed. V. Ilyin was a pseudonym used by Lenin.—*Trans.*)

"Engels, apparently, having learned that according to Kant the 'thing-in-itself' is unknowable, turned this theorem into its converse and concluded that everything unknown is the thing-in-itself" (p. 33).

Listen, Mr. Machian: lie, but don't overdo it! Why, before the very eyes of the public you are distorting the very quotation from Engels you have set out to "tear to pieces," without even having grasped the point under discussion!

In the first place, it is not true that Engels "is producing a refutation of the thing-in-itself." Engels said explicitly and clearly that he was refuting the *Kantian ungraspable* (or unknowable) thing-in-itself. Mr. Chernov confuses Engels' materialist conception of the existence of things independently of our consciousness. In the second place, if Kant's theorem reads that the thing-in-itself is unknowable, the *"converse"* theorem would be: the *unknowable* is the thing-in-itself. Mr. Chernov *replaces* the unknowable by the *unknown,* without realising that by such a substitution he has again confused and distorted the materialist view of Engels!

Mr. V. Chernov is so bewildered by the reactionaries of official philosophy whom he has taken as his mentors, that he raises an outcry against Engels *without in the least comprehending* the meaning of the example quoted. Let us try to explain to this representative of Machism what it is all about.

Engels clearly and explicitly states that he is contesting both Hume and Kant. Yet there is no mention whatever in Hume of "unknowable things-in-themselves." What then is there in common between these two philosophers? It is that they both *in principle fence off* "the appearance" from that which appears, the perception from that which is perceived, the thing-for-us from the "thing-in-itself." Furthermore, Hume does not want to hear of the "thing-in-itself," he regards the very thought of it as philosophically inadmissible, as "metaphysics" (as the Humeans and Kantians call it); whereas Kant grants the existence of the "thing-in-itself," but declares it to be "unknowable," fundamentally different from the phenomenon, belonging to a fundamentally different realm, the realm of the "beyond" *(Jenseits),* inaccessible to knowledge, but revealed to faith.

What is the kernel of Engels' objections? Yesterday we did not know that coal tar contained alizarin. Today we learned that it does. The question is, did coal tar contain alizarin yesterday?

Of course it did. To doubt it would be to make a mockery of modern science.

And if that is so, three important epistemological conclusions follow:

1) Things exist independently of our consciousness, independently of our perceptions, outside of us, for it is beyond doubt that alizarin existed in coal tar yesterday and it is equally beyond doubt that yesterday we knew nothing of the existence of this alizarin and received no sensations from it.

2) There is definitely no difference in principle between the phenomenon and the thing-in-itself, and there can be no such difference. The only difference is between what is known and what is not yet known. And philosophical inventions of specific boundaries between the one and the other, inventions to the effect that the thing-in itself is "beyond" phenomena (Kant), or that we can or must fence ourselves off by some philosophical partition from the problem of a world which in one part or another is still unknown but which exists outside us (Hume)—all this is the sheerest nonsense, *Schrulle*, trick, invention.

3) In the theory of knowledge, as in every other branch of science, we must think dialectically, that is, we must not regard our knowledge as ready-made and unalterable, but must determine how *knowledge* emerges from *ignorance,* how incomplete, inexact knowledge becomes more complete and more exact.

Once we accept the point of view that human knowledge develops from ignorance, we shall find millions of examples of it just as simple as the discovery of alizarin in coal tar, millions of observations not only in the history of science and technology but in the everyday life of each and every one of us that illustrate the transformation of "things-in-themselves" into "things-for-us," the appearance of "phenomena" when our sense-organs experience a jolt from external objects, the disappearance of "phenomena" when some obstacle prevents the action upon our sense-organs of an object which we know to exist. The sole and unavoidable deduction to be made from this—a deduction which all of us make in everyday practice and which materialism deliberately places at the foundation of its epistemology—is that outside us, and independently of us, there exist objects, things and bodies and that our perceptions are images of the external world. Mach's converse theory (that bodies are complexes of sensations) is nothing but pitiful idealist nonsense. And Mr. Chernov, in his "analysis" of Engels, once more revealed his Voroshilov qualities; Engels' simple example seemed to him "strange and naïve"! He regards only *gelehrtes* fiction as genuine philosophy and is unable to distinguish professorial eclecticism from the consistent materialist theory of knowledge.

It is both impossible and unnecessary to analyse Mr. Chernov's other arguments; they all amount to the same pretentious rigmarole (like the assertion that for the materialists the atom is the thing-in-itself!). We shall note only the argument which is relevant to our discussion (an argument which has apparently led certain people astray), *viz.*, that Marx supposedly differed from Engels. The question at issue is Marx's *second* Thesis on Feuerbach and Plekhanov's translation of the word *Diesseitigkeit*.

Here is the second Thesis:

"The question whether objective truth can be attributed to human thinking is not a question of theory, but is a practical question. In practice man must prove the truth, *i.e.*, the reality and power, the 'this-sidedness' of his thinking. The dispute over the reality or non-reality of thinking which is isolated from practice is a purely scholastic question."[1]

Instead of "prove . . . the this-sidedness of . . . thinking" (a literal translation), Plekhanov has: prove that thinking "does not stop at this side of phenomena." And Mr. V. Chernov cries: "The contradiction between Marx and Engels is eliminated very simply. . . . It appears as though Marx, like Engels, asserted the knowability of things-in-themselves and the 'other-sidedness' of thinking" (*loc. cit.*, p. 34, note).

What can be done with a Voroshilov whose every phrase makes confusion worse confounded! It is sheer ignorance, Mr. Victor Chernov, not to know that all materialists assert the knowability of things-in-themselves. It is ignorance, Mr. Victor Chernov, or infinite slovenliness, to skip the *very first* phrase of the thesis and not to realise that the "objective truth" *(gegenständliche Wahrheit)* of thinking *means nothing else* than the *existence* of objects (*i.e.*, "things-in-themselves") *truly* reflected by thinking. It is sheer illiteracy, Mr. Victor Chernov, to assert that from Plekhanov's paraphrase (Plekhanov gave a paraphrase and not a translation) "it appears as though" Marx defended the *other-sidedness* of thought. Because only the Humeans and the Kantians confine thought to "this side of phenomena." But for all materialists, including those of the seventeenth century whom Bishop Berkeley demolished (see Introduction), "phenomena" are "things-for-us" or *copies* of the "objects-in-themselves." Of course, Plekhanov's free paraphrase is not obligatory upon those who desire to know Marx himself, but it is obligatory to try to understand what Marx meant and not to prance about like a Voroshilov.

It is interesting to note that while among people who call themselves socialists we encounter an unwillingness or inability to grasp the meaning of Marx's "Theses," bourgeois writers, specialists in philosophy, sometimes manifest greater scrupulousness. I know of one such writer who studied the philosophy of Feuerbach and in connection with it

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[1] See Appendix to Engels' *Ludwig Feuerbach*, p. 73.—*Trans.*

Marx's "Theses." That writer is Albert Levy, who devoted the third chapter of the second part of his book on Feuerbach to an examination of the influence of Feuerbach on Marx.[1] Without going into the question whether Levy always interprets Feuerbach correctly, or how he criticises Marx from the ordinary bourgeois standpoint, we shall only quote his opinion of the philosophical content of Marx's famous "Theses." Regarding the first Thesis, Levy says: "Marx, on the one hand, together with all earlier materialism and with Feuerbach, recognises that there are real and distinct objects outside us corresponding to our ideas of things. . . ."

As the reader sees, it was immediately clear to Albert Levy that the basic position not only of Marxian materialism but of *every* materialism, of *"all earlier"* materialism, is the recognition of real objects outside us, to which objects our ideas "correspond." This elementary truth, which holds good for *all* materialism in general, is unknown only to the Russian Machians. Levy continues:

". . . On the other hand, Marx expresses regret that materialism had left it to idealism to appreciate the importance of the active forces [*i.e.,* human practice], which, according to Marx, must be wrested from idealism in order to integrate them into the materialist system. But it will of course be necessary to give these active forces the real and sensible character which idealism cannot grant them. Marx's idea, then, is the following: just as to our ideas there correspond real objects outside us, so to our phenomenal activity there corresponds a real activity outside us, an activity of things. In this sense humanity partakes of the absolute, not only through theoretical knowledge but also through practical activity; thus all human activity acquires a dignity, a nobility, that permits it to advance hand in hand with theory. Revolutionary activity henceforth acquires a metaphysical significance. . . ."

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[1] Albert Lévy, *La philosophie de Feuerbach et son influence sur la littérature allemande.* Paris, 1904, pp. 249-338, on the influence of Feuerbach on Marx, and pp. 290-98, an examination of the "Theses."

Albert Levy is a professor. And a proper professor must inveigh against the materialists for being metaphysicians. For the idealist professors of the Humean and Kantian variety every kind of materialism is "metaphysics," because beyond the phenomenon (appearance, the thing-for-us) it discerns a reality outside us. A. Levy is therefore essentially right when he says that in Marx's opinion there corresponds to the "phenomenal activity" of humanity "an activity of things," that is to say, human practice has not only a phenomenal (in the Humean and Kantian sense of the term), but an objectively real significance. The criterion of practice—as we shall show in detail in its proper place (§ 6)—has entirely different meanings for Mach and Marx. "Humanity partakes of the absolute" means that human knowledge reflects absolute truth (see below, § 5); the practice of humanity, by verifying our ideas, corroborates what in those ideas corresponds to absolute truth. A. Levy continues:

"...Having reached this point, Marx naturally encounters the objections of the critics. He has admitted the existence of things-in-themselves, of which our theory is the human translation. He cannot evade the usual objection: what assurance have you of the accuracy of the translation? What proof have you that the human mind gives you an objective truth? To this objection Marx replies in his second Thesis" (p. 291).

The reader sees that Levy does not for a moment doubt that Marx recognised the existence of things-in-themselves!

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2. "TRANSCENDENCE," OR BAZAROV "REVISES" ENGELS

But while the Russian Machian would-be Marxists diplomatically evaded *one* of the most emphatic and explicit statements of Engels they "revised" *another* statement of his in quite the Chernov manner. However tedious and laborious the task of correcting perversions and mutilations of the meaning of quotations may be, he who wishes to speak of the Russian Machians cannot avoid it.

Here is Bazarov's revision of Engels.

In the article "On Historical Materialism,"[1] Engels speaks of the English agnostics (philosophers of Hume's trend of thought) as follows:

"... Our agnostic admits that all our knowledge is based upon the information *(Mitteilungen)* imparted to us by our senses...."

Let us note for the benefit of our Machians that the agnostic (Humean) also starts from *sensations* and recognises no other source of knowledge. The agnostic is a pure *"positivist,"* be it said for the benefit of the adherents of the "latest positivism."

"... But, he [the agnostic] adds, how do we know that our senses give us correct representations *(Abbilder)* of the objects we perceive through them? And he proceeds to inform us that, whenever he speaks of objects or their qualities he does in reality not mean these objects and qualities, of which he cannot know anything for certain, but merely the impressions which they have produced on his senses...."

What two lines of philosophical tendency does Engels contrast here? One line is that the senses give us faithful images of things, that we know *the things themselves,* that the outer world acts on our sense-organs. This is materialism—with which the agnostic is not in agreement. What then is the *essence* of the agnostic's line? It is that he *does not go beyond* sensations, that *he stops on this side of phenomena,* refusing to see anything "certain" beyond the boundary of sensations. About *these things themselves* (*i.e.,* about the things-in-themselves, the "objects-in-themselves," as the materialists whom Berkeley opposed called them), we can know nothing certain—so the agnostic categorically insists. Hence, in the controversy of which Engels speaks the materialist affirms the existence and knowability of things-in-themselves. The agnostic does not even *admit the thought* of things-in-themselves and insists that we can know nothing certain about them.

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[1] This article forms the Introduction to the English edition of Engels' *Socialism: Utopian and Scientific* and was translated by Engels himself into German in the *Neue Zeit,* XI, I (1892-93, No. 1). The only Russian translation, if I am not mistaken, is to be found in the symposium *Historical Materialism,* p. 162, *et seq.* Bazarov quotes the passage in the *Studies "in" the Philosophy of Marxism,* p. 64.

It may be asked in what way the position of the agnostic as outlined by Engels differs from the position of Mach? In the "new" term "element"? But it is sheer childishness to believe that a nomenclature can change a philosophical line, that sensations when called "elements" cease to be sensations! Or does the difference lie in the "new" idea that the very same elements constitute the physical in one connection and the psychical in another? But did you not observe that Engels' agnostic *also* puts "impressions" in place of the "things themselves"? That means that *in essence* the agnostic too differentiates between physical and psychical *"impressions"*! Here again the difference is *exclusively* one of nomenclature. When Mach says that objects are complexes of sensations, Mach is a Berkeleian; when Mach "corrects" himself, and says that "elements" (sensations) can be physical in one connection and psychical in another, Mach is an agnostic, a Humean. Mach does not go beyond these two *lines* in his philosophy, and it requires extreme naïveté to take this muddlehead at his word and believe that he has actually "transcended" both materialism and idealism.

Engels deliberately mentions no names in his exposition, and criticises not individual representatives of Humism (professional philosophers are very prone to call original systems the petty variations one or another of them makes in terminology or argument), but *the whole* Humean line. Engels criticises not particulars but the essential thing; he examines the *fundamental* wherein *all* Humeans *deviate* from materialism, and his criticism therefore embraces Mill, Huxley and Mach alike. Whether we say (with J. S. Mill) that matter is the permanent possibility of sensation, or (with Ernst Mach) that matter is more or less stable complexes of "elements"—sensations—we remain within *the bounds* of agnosticism, or Humism. Both standpoints, or more correctly both formulations, are *covered* by Engels' exposition of agnosticism: the agnostic does not go beyond sensations and asserts that he *cannot* know anything certain about their source, about their original, etc. And if Mach attributes such great importance to his disagreement with Mill on this question, it is because Mach comes under Engels' characterisation of a professor-in-ordinary: *Flohknacker*. Ay, gentlemen, you have only cracked a flea by making petty corrections and by altering terminology instead of entirely abandoning the basic, half-hearted standpoint.

And how does the materialist Engels—at the beginning of the article Engels explicitly and emphatically contrasts his materialism to agnosticism—refute the foregoing arguments?

"... Now, this line of reasoning seems undoubtedly hard to beat by mere argumentation. But before there was argumentation there was action. *Im Anfang war die Tat*. And human action had solved the difficulty long before human ingenuity invented it. The proof of the pudding is in the eating. From the moment we turn to our own use these objects, according to the qualities we perceive in them, we put to an infallible test the correctness or otherwise of our sense-perceptions. If these perceptions have been wrong, then our estimate of the use to which an object can be turned must also be wrong, and our attempt must fail. But if we succeed in accomplishing our aim, if we find that the object does agree with our idea of it, and does answer the purpose we intended it for, then that is positive proof that our perceptions of it and of its qualities, so far, agree with reality outside ourselves...."

Thus, the materialist theory, the theory of the reflection of objects by our mind, is here presented with absolute clarity: things exist outside us. Our perceptions and ideas are their images. Verification of these images, differentiation between true and false images, is given by practice. But let us listen to a little more of Engels (Bazarov at this point ends his quotation from Engels, or rather from Plekhanov, for he deems it unnecessary to deal with Engels himself):

"... And whenever we find ourselves face to face with a failure, then we generally are not long in making out the cause that made us fail; we find that the perception upon which we acted was either incomplete and superficial, or combined with the results of other perceptions in a way not warranted by them [the Russian translation in *On Historical Materialism* is incorrect]—what we call defective reasoning. So long as we take care to train and to use our senses properly, and to keep our action within the limits prescribed by perceptions properly made and properly used, so long we shall find that the result of our action proves the conformity *(Uebereinstimmung)* of our perceptions with the objective *(gegenständlich)* nature of the things perceived. Not in one single instance, so far, have we been led to the conclusion that our sense-perceptions, scientifically controlled, induce in our minds ideas respecting the outer world that are, by their very nature, at variance with reality, or that there is an inherent incompatibility between the outer world and our sense-perceptions of it.

"But then come the Neo-Kantian agnostics and say...."

We shall leave to another time the examination of the arguments of the Neo-Kantians. Let us remark here that anybody in the least acquainted with the subject, or even the least bit attentive, cannot fail to understand that Engels is here expounding the very same materialism against which the Machians are always and everywhere doing battle. And now just watch the manner in which Bazarov revises Engels:

"Here," writes Bazarov in connection with the fragment of the quotation we have given, "Engels is actually attacking Kantian idealism...."

It is not true. Bazarov is muddling things. In the passage which he quoted, and which is quoted by us more fully, there is *not a syllable either* about Kantianism *or* about idealism. Had Bazarov really read the whole of Engels' article, he could not have avoided seeing that Engels speaks of Neo-Kantianism, and of Kant's whole line, *only in the next* paragraph, just where we broke off our quotation. And had Bazarov attentively read and reflected on the fragment he himself quotes, he could not have avoided seeing that in the arguments of the agnostic which Engels here refutes there is *not a trace* of either idealism or Kantianism; for idealism begins only when the philosopher says that things are our sensations, while Kantianism begins when the philosopher says that the thing-in-itself exists but is unknowable. Bazarov confuses Kantianism with Humism; and he confuses them because, being himself a semi-Berkeleian, a semi-Humean of the Machian sect, he does not understand (as will be shown in detail below) the distinction between the Humean and the materialist opposition to Kantianism.

"...But, alas!" continues Bazarov, "his argument is aimed against Plekhanov's philosophy just as much as it is against Kantian philosophy. In the school of Plekhanov-Orthodox, as Bogdanov has already pointed out, there is a fatal misunderstanding regarding consciousness. To Plekhanov, as to all idealists, it seems that everything perceptually given, *i.e.*, cognised, is 'subjective'; that to proceed only from what is factually given is to be a solipsist; that *real being* can be found only beyond the boundaries of everything that is immediately given...."

This is entirely in the spirit of Chernov and his assurances that Liebknecht was a true-Russian Narodnik! If Plekhanov is an idealist who has deserted Engels, then why is it that you, who are supposedly an adherent of Engels, are not a materialist? This is nothing but wretched mystification, Comrade Bazarov! By means of the Machian expression *"immediately given"* you begin to confuse the difference between agnosticism, idealism and materialism. Don't you understand that such expressions as the "immediately given" and the "factually given" are part of the rigmarole of the Machians, the immanentists, and the other reactionaries in philosophy, a masquerade, whereby the agnostic (and sometimes, as in Mach's case, the idealist too) disguises himself in the cloak of the materialist? For the materialist the "factually given" is the outer world, the image of which is our sensations. For the idealist the "factually given" is sensation, and the outer world is declared to be a "complex of sensations." For the agnostic the "immediately given" is also sensation, but the agnostic *does not go on* either to the materialist recognition of the reality of the outer world, or to the idealist recognition of the world as our sensation. Therefore your statement that "real being [according to Plekhanov] can be found only beyond the boundaries of *everything that is immediately given*" is sheer nonsense and inevitably follows from your Machian position. But while you have a perfect right to adopt any position you choose, including a Machian one, you have no right to falsify Engels when you speak of him. And from Engels' words it is perfectly clear that for the materialist real being lies *beyond* the "sense-perceptions," impressions and ideas of man, while for the agnostic it is impossible to go *beyond* these perceptions. Bazarov believed Mach, Avenarius, and Schuppe when they said that the "immediately" (or factually) given connects the perceiving *self* with the perceived environment in the famous "indissoluble" co-ordination, and endeavours, unobserved by the reader, to impute this nonsense to the materialist Engels!

"... It is as though the foregoing passage from Engels was deliberately written by him in a very popular and accessible form in order to dissipate this idealist misunderstanding...."

Not for nought was Bazarov a pupil of Avenarius! He continues his mystification: under the pretence of combating idealism (of which Engels is not speaking here), he smuggles in the *idealist* "co-ordination." Not bad, Comrade Bazarov!

"... The agnostic asks, how do we know that our subjective senses give us a correct presentation of objects?..."

You are muddling things, Comrade Bazarov! Engels himself does not speak of, and does not even ascribe to his foe the agnostic, such nonsense as *"subjective"* senses. There are no other senses except human, *i.e.*, "subjective" senses, for we are speaking from the standpoint of man and not of a hobgoblin. You are again trying to impute Machism to Engels, to imply that he says: the agnostic regards senses, or, to be more precise, sensations, as *only* subjective (which the agnostic does *not* do!), while we and Avenarius have "co-ordinated" the object into an indissoluble connection with the subject. Not bad, Comrade Bazarov!

"...But what do you term 'correct'?—Engels rejoins.—That is correct which is confirmed by our practice; and consequently, since our sense-perceptions are confirmed by experience, they are not 'subjective,' that is, they are not arbitrary, or illusory, but correct and real as such...."

You are muddling things, Comrade Bazarov! You have substituted for the question of the existence of things outside our sensations, perceptions, ideas, the question of the criterion of the correctness of our ideas of "these same" things, or, more precisely, you are *hedging* the former question with the help of the latter. But Engels says explicitly and clearly that what distinguishes him from the agnostic is not only the agnostic's doubt as to whether our images are "correct," but also the agnostic's doubt as to whether we may speak of the *things themselves,* as to whether we may have "certain" knowledge of their existence. Why did Bazarov resort to this juggling? In order to obscure and confound what is the *basic* question for materialism (and for Engels, as a materialist), *viz.,* the question of the existence of things outside our mind, which, by acting on our sense-organs, evoke sensations. It is impossible to be a materialist without answering this question in the affirmative; but one can be a materialist and still differ on what constitutes the criterion of the correctness of the images presented by our senses.

And Bazarov muddles matters still more when he attributes to Engels, in the dispute with the agnostic, the absurd and ignorant expression that our sense-perceptions are confirmed by *"experience."* Engels did not use and could not have used this word *here,* for Engels *was well aware* that the idealist Berkeley, the agnostic Hume and the materialist Diderot all had recourse to experience.

"...Inside the limits within which we have to do with objects in practice, *perceptions of the object and of its* *properties coincide with a reality existing outside us.* 'To coincide' is somewhat different from being a 'hieroglyphic.' 'They coincide' means that, within the given limits, the sense-perception *is* [Bazarov's italics] the reality existing outside us...."

The end crowns the work. Engels has been treated à la Mach, fried and served with a Machian sauce. But take care you do not choke, worthy cooks!

"Sense-perception *is* the reality existing outside us!" This *is* just the fundamental absurdity, the fundamental muddle and falsity of Machism, from which flows all the rest of the balderdash of this philosophy and for which Mach and Avenarius have been embraced by those arrant reactionaries and preachers of clericalism, the immanentists. However much V. Bazarov wriggled, however cunning and diplomatic he was in evading ticklish points, in the end he gave himself away and betrayed his true Machian character! To say that "sense-perception *is* the reality existing outside us" *is to return to Humism, or even Berkeleianism,* concealing itself in the fog of "co-ordination." This is either an idealist lie or the subterfuge of the agnostic, Comrade Bazarov, for sense-perception *is not* the reality existing outside us, it is only the *image* of that reality. Are you trying to make capital of the ambiguous Russian word *sovpadat?*[1] Are you trying to lead the unsophisticated reader to believe that "to coincide" here means "to be identical," and not "to correspond to"? That means basing one's falsification of Engels à la Mach on a perversion of the meaning of a quotation, and nothing more.

Take the German original and you will find there the words *stimmen mit,* which means to correspond with, "to voice with"—the latter translation is literal, for *Stimme* means voice. The words *"stimmen mit" cannot* mean "to coincide" in the sense of *"to be* identical." And even for the reader who does not know German but who reads Engels with the least bit of attention, it is perfectly clear, it cannot be otherwise than clear, that Engels throughout his whole argument treats the expression "sense-perception" as the *image (Abbild)* of the reality existing outside us, and that therefore the word "coincide" can be used in Russian exclusively in the sense of "correspondence," "concurrence," etc. To attribute to Engels the thought that "sense-perception is the reality existing outside us" is such a pearl of Machian distortion, such a flagrant attempt to palm off agnosticism and idealism as materialism, that one must admit that Bazarov has broken all records!

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[1] *Sovpadat*—to coincide.—*Trans.*

One asks, how can sane people in sound mind and judgment assert that "sense-perception [within what limits is not important] is the reality existing outside us"? The earth is a reality existing outside us. It cannot "coincide" (in the sense of being identical) with our sense-perception, or be in indissoluble co-ordination with it, or be a "complex of elements" in another connection identical with sensation; for the earth existed at a time when there were no men, no sense-organs, no matter organised in that superior form in which its property of sensation is in any way clearly perceptible.

That is just the point, that the tortuous theories of "co-ordination," "introjection," and the newly-discovered world elements which we analysed in Chapter I serve to cover up this idealist absurdity. Bazarov's formulation, so inadvertently and incautiously thrown off by him, is excellent in that it patently reveals that crying absurdity, which otherwise it would have been necessary to excavate from the piles of erudite, pseudo-scientific, professorial rigmarole.

All praise to you, Comrade Bazarov! We shall erect a monument to you in your lifetime. On one side we shall engrave your dictum, and on the other: "To the Russian Machian who dug the grave of Machism among the Russian Marxists!"

* * *

We shall speak separately of the two points touched on by Bazarov in the above-mentioned quotation, *viz.*, the criteria of practice of the agnostics (Machians included) and the materialists, and the difference between the theory of reflection (or images) and the theory of symbols (or hieroglyphics). For the present we shall continue to quote a little more from Bazarov:

"...But what is beyond these boundaries? Of this Engels does not say a word. He nowhere manifests a desire to perform that 'transcendence,' that stepping beyond the boundaries of the perceptually-given world, which lies at the foundation of Plekhanov's 'theory of knowledge'...."

Beyond what "boundaries"? Does he mean the boundaries of the "co-ordination" of Mach and Avenarius, which supposedly indissolubly merges the self with the environment, the subject with the object? The very question put by Bazarov is devoid of meaning. But if he had put the question in an intelligible way, he would have clearly seen that the external world lies "beyond the boundaries" of man's sensations, perceptions and ideas. But the word "transcendence" once more betrays Bazarov. It is a specifically Kantian and Humean "crotchet" to erect *in principle* a boundary between the *appearance* and the *thing-in-itself*. To pass from the appearance, or, if you will, from our sensation, perception, etc., to the thing existing outside of perception is a *transcendence*, Kant says; and we permit this *transcendence* not to knowledge but to faith. We do not permit transcendence at all, Hume objects. And the Kantians, like the Humeans, call the materialists *transcendental* realists, "metaphysicians," who effect an illegitimate *passage* (in Latin, *transcensus*) from one region to another, fundamentally different, region. In the works of the contemporary professors of philosophy who follow the reactionary line of Kant and Hume, you may encounter (take only the names enumerated by Voroshilov-Chernov) endless repetitions made in a thousand keys of the charge that materialism is "metaphysical" and "transcendent." Bazarov borrowed from the reactionary professors both the word and the process of thought, and flourishes them in the name of "recent positivism"! As a matter of fact the very idea of the "transcendence," *i.e.*, of a boundary *in principle* between the appearance and the thing-in-itself, is a nonsensical idea of the agnostics (Humeans and Kantians included) and the idealists. We have already explained this in connection with Engels' example of alizarin, and we shall explain it again in the words of Feuerbach and Joseph Dietzgen. But let us first finish with Bazarov's "revision" of Engels:

"...In one place in his *Anti-Dühring*, Engels says that 'being' outside of the realm of sense-perception is an *offene Frage, i.e.*, a question, for the answer to which, or even for the asking of which we have no data."

Bazarov repeats this argument after the German Machian, Friedrich Adler. This last example is perhaps even worse than the "sense-perception" which "is the reality existing outside us." In his *Anti-Dühring* Engels says:

"The unity of the world does not consist in its being, although its being is a pre-condition of its unity, as it must certainly first *be*, before it can be *one*. Being, indeed, is always an open question *(offene Frage)* beyond the point where our sphere of observation *(Gesichtskreis)* ends. The real unity of the world consists in its materiality, and this is proved not by a few juggling phrases, but by a long and protracted development of philosophy and natural science."[1]

Behold the new hash our cook has prepared. Engels is speaking of being *beyond* the point where our sphere of observation ends, for instance, the existence of men on Mars. Obviously, such being is indeed an open question. And Bazarov, as though deliberately refraining from giving the full quotation, paraphrases Engels as saying that *"being outside the realm of sense-perception"* is an open question!! This is the sheerest nonsense and Engels is here being saddled with the views of those professors of philosophy whom Bazarov is accustomed to take at their word and whom Dietzgen justly called the graduated flunkeys of clericalism or fideism. Indeed, fideism positively asserts that something does exist "beyond the world of perception." The materialists, in agreement with natural science, vigorously deny this. An intermediate position is held by those professors, Kantians, Humeans (including the Machians), etc., "who have found the truth outside materialism and idealism" and who "compromise," saying: it is an open question. Had Engels ever said anything like this, it would be a shame and disgrace to call oneself a Marxist.

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[1] F. Engels, *Anti-Dühring*, pp. 52-53.—*Trans.*

But enough! Half a page of quotation from Bazarov presents such a complete tangle that we are obliged to content ourselves with what has already been said and not to continue following all the waverings of Machian thought.

3. L. FEUERBACH AND J. DIETZGEN ON THE THING-IN-ITSELF

To show how absurd are the assertions of our Machians that the materialists Marx and Engels denied the existence of things-in-themselves (*i.e.,* things outside our sensations, perceptions, and so forth) and the possibility of their cognition, and that they admitted the existence of an absolute boundary between the appearance and the thing-in-itself, we shall give a few more quotations from Feuerbach. The whole trouble with our Machians is that they set about parroting the words of the reactionary professors on dialectical materialism without themselves knowing anything *either* of dialectics *or* of materialism.

"Modern philosophical spiritualism," says Feuerbach, "which calls itself idealism, utters the annihilating, in its own opinion, stricture against materialism that it is dogmatism, *viz.,* that it starts from the sensuous *(sinnlichen)* world as though from an undisputed *(ausgemachte)* objective truth, and assumes that it is a world in itself *(an sich), i.e.,* as existing without us, while in reality the world is only a product of spirit" (*Sämtliche Werke,* Band X, 1866, S. 185).

This seems clear enough. The world in itself is a world that exists *without us.* This materialism of Feuerbach's, like the materialism of the seventeenth century contested by Bishop Berkeley, consisted in the recognition that "objects-in-themselves" exist outside our mind. The *an sich* (of itself, or "in itself") of Feuerbach is the absolute contrary of the *an sich* of Kant. Let us recall the excerpt from Feuerbach already quoted, where he rebukes Kant because for the latter the "thing-in-itself" is an "abstraction without reality." For Feuerbach the "thing-in-itself" is an "abstraction *with* reality," that is, a world existing outside us, completely knowable and fundamentally not different from "appearance."

Feuerbach very ingeniously and clearly explains how ridiculous it is to postulate a "transcendence" from the world of phenomena to the world in itself, a sort of impassable gulf created by the priests and taken over from them by the professors of philosophy. Here is one of his explanations:

"Of course, the products of fantasy are also products of nature, for the force of fantasy, like all other human forces, is in the last analysis *(zuletzt)* both in its basis and in its origin a force of nature; nevertheless, a human being is a being distinguished from the sun, moon and stars, from stones, animals and plants, in a word, from those beings *(Wesen)* which he designates by the general name, 'nature'; and consequently, man's presentations *(Bilder)* of the sun, moon and stars and the other beings of nature *(Naturwesen)*, although these presentations are products of nature, are yet products *distinct* from their objects in nature" (*Werke*, Band VII, Stuttgart 1903, S. 516).

The objects of our ideas are distinct from our ideas, the thing-in-itself is distinct from the thing-for-us, for the latter is only a part, or only one aspect, of the former, just as man himself is only a fragment of the nature reflected in his ideas.

"... The taste-nerve is just as much a product of nature as salt is, but it does not follow from this that the taste of salt is directly as such an objective property of salt, that what salt is merely as an object of sensation it also is in itself *(an und für sich)*, hence that the sensation of salt on the tongue is a property of salt thought of without sensation *(des ohne Empfindung gedachten Salzes)*. ..." And several pages earlier: "Saltiness, as a taste, is the subjective expression of an objective property of salt" (*ibid.*, p. 514).

Sensation is the result of the action of a thing-in-itself, existing objectively outside us, upon our sense-organs—such is Feuerbach's theory. Sensation is a subjective image of the objective world, of the world *an und für sich.*

"... So is man also a being of nature *(Naturwesen),* like sun, star, plant, animal, and stone, nevertheless, he is distinct from nature, and, consequently, nature in the head and heart of man is distinct from nature outside the human head and heart."

"... However, this object, *viz.,* man, is the only object in which, according to the statement of the idealists themselves, the requirement of the 'identity of object and subject' is realised; for man is an object whose equality and unity with my being are beyond all possible doubt.... And is not one man for another, even the most intimate, an object of fantasy, of the imagination? Does not each man comprehend another in his own way, after his own mind *(in und nach seinem Sinne)*?... And if even between man and man, between mind and mind, there is a very considerable difference which it is impossible to ignore, how much greater must be the difference between an unthinking, non-human, dissimilar (to us) being in itself *(Wesen an sich)* and the same being as we think of it, perceive it and apprehend it?" (*ibid.*, p. 518.)

All the mysterious, sage and subtle distinctions between the phenomenon and the thing-in-itself are sheer philosophical balderdash. In practice each one of us has observed time without number the simple and palpable transformation of the "thing-in-itself" into phenomenon, into the "thing-for-us." It is precisely this transformation that is cognition. The "doctrine" of Machism that since we know *only* sensations, we cannot know of the *existence* of anything beyond the bounds of sensation, is an old sophism of idealist and agnostic philosophy served up with a new sauce.

Joseph Dietzgen is a dialectical materialist. We shall show below that his mode of expression is often inexact, that he is often not free from confusion, a fact which has been seized upon by various foolish people (Eugene Dietzgen among them) and of course by our Machians. But they did not take the trouble or were unable to analyse the dominant line of his philosophy and to disengage his materialism from alien elements.

"Let us take the world as the 'thing-in-itself,'" says Dietzgen in his *Das Wesen der menschlichen Kopfarbeit.* "We shall easily see that the 'world *in itself*' and the world as it *appears* to us, the phenomena of the world, differ from each other only as the whole differs from its parts" (German ed., 1903, p. 65). "A phenomenon differs no more and no less from the thing which produces it than the ten-mile stretch of a road differs from the road itself" (pp. 71-72). There is not, nor can there be, any essential difference here, any "transcendence," or "innate disagreement." But a difference there is, to be sure, *viz.*, the passage *beyond the bounds* of sense-perceptions to the *existence* of things outside us.

"We learn by experience *(wir erfahren)*," says Dietzgen in his *Streifzügen eines Sozialisten in das Gebiet der Erkenntnistheorie*, "that each experience is only a *part* of that which, in the words of Kant, passes beyond the bounds of all experience.... For a consciousness that has become conscious of its own nature, each particle, be it of dust, or of stone, or of wood, is something *unknowable in its full extent (Unauskenntliches), i.e.*, each particle is inexhaustible material for the human faculty of cognition and, consequently, something which passes beyond experience" (*Kleinere philosophische Schriften*, 1903, S. 199).

You see: *in the words of Kant, i.e.*, adopting—exclusively for purposes of popularisation, for purposes of contrast—Kant's *erroneous*, confusing terminology, Dietzgen recognises the passage "beyond experience." This is a good example of what the Machians are grasping at when they pass from materialism to agnosticism: you see, they say, we do not wish to go "beyond experience"; for us "sense-perception *is* the reality existing outside us."

"Unhealthy mysticism [Dietzgen objects precisely to such a philosophy] unscientifically separates the absolute truth from the relative truth. It makes of the thing as it appears and the 'thing-in-itself,' that is, of the appearance and truth, two categories which differ *toto coelo* [completely, fundamentally] from each other and are not contained sublated in any common category" (S. 200).

We can now judge the knowledge and ingenuity of Bogdanov, the Russian Machian, who does not wish to acknowledge himself a Machian and wishes to be regarded as a Marxist in philosophy.

"A golden mean [between "panpsychism and panmaterialism"] has been adopted by materialists of a more critical shade who have rejected the *absolute* unknowability of the 'thing-in-itself,' but at the same time regard it as being *fundamentally* [Bogdanov's italics] different from the 'phenomenon' and, therefore, always only 'dimly discernible' in it, beyond experience as far as its content is concerned [that is, presumably, as far as the "elements" are concerned, which are not the same as elements of experience], but yet lying within the bounds of what is called the forms of experience, *i.e.,* time, space and causality. Such is approximately the standpoint of the French materialists of the eighteenth century and among the modern philosophers—Engels and his Russian follower, Beltov"[1] (*Empirio-Monism,* Bk. II, 2nd ed., 1907, pp. 40-41).

This is a complete muddle. 1) The materialists of the *seventeenth century,* against whom Berkeley argues, hold that "objects in themselves" are absolutely knowable, for our presentations, ideas, are only copies or reflections of those objects, which exist "outside the mind" (see *Introduction*). 2) *Feuerbach,* and J. Dietzgen after him, vigorously dispute any "fundamental" difference between the thing-in-itself and the phenomenon, and Engels disposes of this view by his brief example of the transformation of the "thing-in-itself" into the "thing-for-us." 3) Finally, to maintain that the materialists regard things-in-themselves as "always only dimly discernible in the phenomenon" is sheer nonsense, as we have seen from Engels' refutation of the agnostic. The reason for Bogdanov's distortion of materialism lies in his failure to understand the relation of absolute truth to relative truth (of which we shall speak later). As regards the "outside-of-experience" thing-in-itself and the "elements of experience," these are already the beginnings of the Machian muddle of which we have already said enough.

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[1] A pseudonym of Plekhanov.—*Trans.*

Parroting the incredible nonsense uttered by the reactionary professors about the materialists, disavowing Engels in 1907, and attempting to "revise" Engels into agnosticism in 1908—such is the philosophy of the "recent positivism" of the Russian Machians!

4. DOES OBJECTIVE TRUTH EXIST?

Bogdanov declares: "As I understand it, Marxism contains a denial of the unconditional objectivity of any truth whatsoever, the denial of all eternal truths" (*Empirio-Monism,* Bk. III, pp. iv-v). What is meant by *"unconditional* objectivity"? "Truth for all eternity" is "an objective truth in the absolute meaning of the word," says Bogdanov in the same passage, and agrees to recognise "objective truth only within the limits of a given epoch."

Two questions are obviously confused here: 1) Is there such a thing as objective truth, that is, can human ideas have a content that does not depend on a subject, that does not depend either on a human being, or on humanity? 2) If so, can human ideas, which give expression to objective truth, express it all at one time, as a whole, unconditionally, absolutely, or only approximately, relatively? This second question is a question of the relation of absolute truth to relative truth.

Bogdanov replies to the second question clearly, explicitly and definitely by rejecting even the slightest admission of absolute truth and by accusing Engels of *eclecticism* for making such an admission. Of this discovery of eclecticism in Engels by A. Bogdanov we shall speak separately later on. For the present we shall confine ourselves to the first question, which Bogdanov, without saying so explicitly, likewise answers in the negative—for although it is possible to deny the element of relativity in one or another human idea without denying the existence of objective truth, it is impossible to deny absolute truth without denying the existence of objective truth.

"... The criterion of objective truth," writes Bogdanov a little further on (p. ix), "in Beltov's sense, does not exist; truth is an ideological form, an organising form of human experience...."

Neither "Beltov's sense"—for it is a question of one of the fundamental philosophical problems and not of Beltov—nor the *criterion* of truth—which must be treated separately, without confounding it with the question of whether objective truth *exists*—has anything to do with the case here. Bogdanov's negative answer to the latter question is clear: if truth is *only* an ideological form, then there can be no truth independent of the subject, of humanity, for neither Bogdanov nor we know any other ideology but human ideology. And Bogdanov's negative answer emerges still more clearly from the second half of his statement: if truth is a form of human experience, then there can be no truth independent of humanity; there can be no objective truth.

Bogdanov's denial of objective truth is agnosticism and subjectivism. The absurdity of this denial is evident even from the single example of a scientific historical truth quoted above. Natural science leaves no room for doubt that its assertion that the earth existed prior to man is a truth. This is entirely compatible with the materialist theory of knowledge: the existence of the thing reflected independent of the reflector (the independence of the external world from the mind) is a fundamental tenet of materialism. The assertion made by science that the earth existed prior to man is an objective truth. This proposition of natural science is incompatible with the philosophy of the Machians and with their doctrine of truth: if truth is an organising form of human experience, then the assertion of the earth's existence *outside* human experience cannot be true.

But that is not all. If truth is only an organising form of human experience, then the teaching, say, of Catholicism is also true. For there is not the slightest doubt that Catholicism is an "organising form of human experience." Bogdanov himself senses the crying falsity of his theory and it is extremely interesting to watch how he attempts to extricate himself from the swamp into which he has fallen.

"The basis of objectivity," we read in Book I of *Empirio-Monism*, "must lie in the sphere of *collective* experience. We term those data of experience objective which have the same vital meaning for us and for other people, those data upon which not only we construct our activities without contradiction, but upon which, we are convinced, other people must also base themselves in order to avoid contradiction. The objective character of the physical world consists in the fact that it exists not for me personally, but for everybody [that is not true! It exists *independently* of everybody!], and has a definite meaning for everybody, the same, I am convinced, as for me. The objectivity of the physical series is its *universal significance* [p. 25, Bogdanov's italics]. The objectivity of the physical bodies we encounter in our experience is in the last analysis established by the mutual verification and co-ordination of the utterances of various people. In general, the physical world is socially-co-ordinated, socially-harmonised, in a word, *socially-organised experience*" (p. 36, Bogdanov's italics).

We shall not repeat that this is a fundamentally untrue, idealist definition, that the physical world exists independently of humanity and of human experience, that the physical world existed at a time when no "sociality" and no "organisation" of human experience was possible, and so forth. We shall now stop to expose the Machian philosophy from another aspect. Objectivity is so defined that religious doctrines, which undoubtedly possess a "universal significance," and so forth, come under the definition. But listen to Bogdanov again: "We remind the reader once more that 'objective' experience is by no means the same as 'social' experience.... Social experience is far from being altogether socially organised and always contains various contradictions, so that certain of its parts do not agree with others. Sprites and hobgoblins may exist in the sphere of social experience of a given people or of a given group of people—for example, the peasantry; but they need not therefore be included under socially-organised or objective experience, for they do not harmonise with the rest of collective experience and do not fit in with its organising forms, for example, with the chain of causality" (p. 45).

Of course it is very gratifying that Bogdanov himself "does not include" the social experience in respect to sprites and hobgoblins under objective experience. But this well-meant amendment in the spirit of anti-fideism by no means corrects the fundamental error of Bogdanov's whole position. Bogdanov's definition of objectivity and of the physical world completely falls to the ground, since the religious doctrine has "universal significance" to a greater degree than the scientific doctrine; the greater part of mankind cling to the former doctrine to this day. Catholicism has been "socially organised, harmonised and co-ordinated" by centuries of development; it *"fits in"* with the "chain of causality" in the most indisputable manner; for religions did not originate without cause, it is not by accident that they retain their hold over the masses under modern conditions, and it is quite "in the order of things" that professors of philosophy should adapt themselves to them. If this undoubtedly universally significant and undoubtedly highly-organised social and religious experience does "not harmonise" with the "experience" of science, it is because there is a fundamental difference between the two, which Bogdanov obliterated when he rejected objective truth. And however much Bogdanov tries to "correct" himself by saying that fideism, or clericalism, does not harmonise with science, the undeniable fact remains that Bogdanov's denial of objective truth completely "harmonises" with fideism. Contemporary fideism does not at all reject science; all it rejects is the "exaggerated claims" of science, to wit, its claim to objective truth. If objective truth exists (as the materialists think), if natural science, reflecting the outer world in human "experience," is alone capable of giving us objective truth, then all fideism is absolutely refuted. But if there is no objective truth, if truth (including scientific truth) is only an organising form of human experience, then this in itself is an admission of the fundamental premise of clericalism, the door is thrown open for it, and a place is cleared for the "organising forms" of religious experience.

The question arises, does this denial of objective truth belong personally to Bogdanov, who refuses to own himself a Machian, or does it follow from the fundamental teachings of Mach and Avenarius? The second is the only possible answer to the question. If only sensation exists in the world (Avenarius in 1876), if bodies are complexes of sensations (Mach, in the *Analyse der Empfindungen*), then we are obviously confronted with a philosophical subjectivism which inevitably leads to the denial of objective truth. And if sensations are called "elements" which in one connection give rise to the physical and in another to the psychical, this, as we have seen, only confuses but does not reject the fundamental point of departure of empirio-criticism. Avenarius and Mach recognise sensations as the source of our knowledge. Consequently, they adopt the standpoint of empiricism (all knowledge derives from experience) or sensationalism (all knowledge derives from sensations). But this standpoint gives rise to the difference between the fundamental philosophical trends, idealism and materialism, and does not eliminate that difference, no matter in what "new" verbal garb ("elements") you clothe it. Both the solipsist, that is, the subjective idealist, and the materialist may regard sensations as the source of our knowledge. Both Berkeley and Diderot started from Locke. The first premise of the theory of knowledge undoubtedly is that the sole source of our knowledge is sensation. Having recognised the first premise, Mach confuses the second important premise, *i.e.*, regarding the objective reality that is given to man in his sensations, or that forms the source of man's sensations. Starting from sensations, one may follow the line of subjectivism, which leads to solipsism ("bodies are complexes or combinations of sensations"), or the line of objectivism, which leads to materialism (sensations are images of objects, of the external world). For the first point of view, *i.e.*, agnosticism, or, pushed a little further, subjective idealism, there can be no objective truth. For the second point of view, *i.e.*, materialism, the recognition of objective truth is essential. This old philosophical question of the two trends, or rather, of the two possible deductions from the premises of empiricism and sensationalism, is not solved by Mach, it is not eliminated or overcome by him, but is *muddled* by verbal trickery with the word "element," and the like. Bogdanov's denial of objective truth is an inevitable consequence of Machism as a whole, and not a deviation from it.

Engels in his *Ludwig Feuerbach* calls Hume and Kant philosophers "who question the possibility of any cognition (or at least of an exhaustive cognition) of the world."[1] Engels, therefore, lays stress on what is common both to Hume and Kant, and not on what divides them. Engels states further that "what is decisive in the refutation of this [Humean and Kantian] view has already been said by Hegel."[2] In this connection it seems to me not uninteresting to note that Hegel, declaring *materialism* to be "a consistent system of empiricism," wrote: "For empiricism the external *(das Aeußerliche)* in general is the truth, and if then a supersensible too be admitted, nevertheless knowledge of it cannot occur *(soll doch eine Erkenntnis desselben [d. h. des Uebersinnlichen] nicht stattfinden können)* and one must keep exclusively to what belongs to perception *(das der Wahrnehmung Angehörige)*. However, this principle in its realisation *(Durchführung)* produced what was subsequently termed *materialism*. This materialism regards matter, as such, as the truly objective *(das wahrhaft Objektive)*."[3]

All knowledge comes from experience, from sensation, from perception. That is true. But the question arises, does *objective reality* "belong to perception," *i.e.*, is it the source of perception? If you answer yes, you are a materialist. If you answer no, you are inconsistent and will inevitably arrive at subjectivism, or agnosticism, irrespective of whether you deny the knowability of the thing-in-itself, or the objectivity of time, space and causality (with Kant), or whether you do not even permit the thought of a thing-in-itself (with Hume). The inconsistency of your empiricism, of your philosophy of experience, will in that case lie in the fact that you deny the objective content of experience, the objective truth of experimental knowledge.

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[1] *Ludwig Feuerbach*, p. 32.—*Trans.*

[2] *Ibid.*

[3] Hegel, *"Enzyklopädie der philosophischen Wissenschaften im Grundrisse,"* *Werke*, 1840, Bd. VI, S. 83. Vgl. S. 122.

Those who hold to the line of Kant and Hume (Mach and Avenarius included, in so far as they are not pure Berkeleians) call us, the materialists, "metaphysicians" because we recognise objective reality which is given us in experience, because we recognise an objective source of our sensations independent of man. We materialists follow Engels in calling the Kantians and Humeans *agnostics,* because they deny objective reality as the source of our sensations. Agnostic is a Greek word: *a* in Greek means "no," *gnosis* "knowledge." The agnostic says: *I do not know* if there is an objective reality which is reflected, imaged by our sensations; I declare there is no way of knowing this (see the words of Engels above quoted setting forth the position of the agnostic). Hence the denial of objective truth by the agnostic, and the tolerance—the philistine, cowardly tolerance—of the dogmas regarding sprites, hobgoblins, Catholic saints, and the like. Mach and Avenarius, pretentiously resorting to a "new" terminology, a supposedly "new" point of view, repeat, in fact, although in a confused and muddled way, the reply of the agnostic: on the one hand, bodies are complexes of sensations (pure subjectivism, pure Berkeleianism); on the other hand, if we rechristen our sensations "elements," we may think of them as existing independently of our sense-organs!

The Machians love to declaim that they are philosophers who completely trust the evidence of our sense-organs, who regard the world as actually being what it seems to us to be, full of sounds, colours, etc., whereas to the materialists, they say, the world is dead, devoid of sound and colour, and in its reality different from what it seems to be, and so forth. Such declamations are indulged in by J. Petzoldt, both in his *Einführung in die Philosophie der reinen Erfahrung* and in his *Weltproblem von positivistischem Standpunkte aus* (1906). Petzoldt is parroted by Mr. Victor Chernov, who waxes enthusiastic over the "new" idea. But, in fact, the Machians are subjectivists and agnostics, for they *do not sufficiently* trust the evidence of our sense-organs and are inconsistent in their sensationalism. They do not recognise objective reality, independent of man, as the source of our sensations. They do not regard sensations as the true copy of this objective reality, thereby directly conflicting with natural science and throwing the door open for fideism. On the contrary, for the materialist the world is richer, livelier, more varied than it actually seems, for with each step in the development of science new aspects are discovered. For the materialist, sensations are images of the ultimate and sole objective reality, ultimate not in the sense that it has already been explored to the end, but in the sense that there is not and cannot be any other. This view irrevocably closes the door not only to every species of fideism, but also to that professorial scholasticism which, while not regarding objective reality as the source of our sensations, "deduces" the concept of the objective by means of such artificial verbal constructions as universal significance, socially-organised, and so on and so forth, and which is unable, and frequently unwilling, to separate objective truth from belief in sprites and hobgoblins.

The Machians contemptuously shrug their shoulders at the "antiquated" views of the "dogmatists," the materialists, who still cling to the concept *matter,* which supposedly has been refuted by "recent science" and "recent positivism." We shall speak separately of the new theories of physics on the structure of matter. But it is absolutely unpardonable to confound, as the Machians do, any particular theory of the structure of matter with the epistemological category, to confound the problem of the new properties of new aspects of matter (electrons, for example) with the old problem of the theory of knowledge, with the problem of the sources of our knowledge, the existence of objective truth, etc. We are told that Mach "discovered the world-elements": red, green, hard, soft, loud, long, etc. We ask, is a man given objective reality when he sees something red or feels something hard, etc., or not? This hoary philosophical query is confused by Mach. If you hold that it is not given, you, together with Mach, inevitably sink to subjectivism and agnosticism and deservedly fall into the embrace of the immanentists, *i.e.*, the philosophical Menshikovs. If you hold that it is given, a philosophical concept is needed for this objective reality, and this concept has been worked out long, long ago. This concept is *matter*. Matter is a philosophical category designating the objective reality which is given to man by his sensations, and which is copied, photographed and reflected by our sensations, while existing independently of them. Therefore, to say that such a concept can become "antiquated" is *childish talk*, a senseless repetition of the arguments of fashionable *reactionary* philosophy. Could the struggle between materialism and idealism, the struggle between the tendencies or lines of Plato and Democritus in philosophy, the struggle between religion and science, the denial of objective truth and its assertion, the struggle between the adherents of supersensible knowledge and its adversaries have become antiquated during the two thousand years of the development of philosophy?

Acceptance or rejection of the concept matter is a question of the confidence man places in the evidence of his sense-organs, a question of the source of our knowledge, a question which has been asked and debated from the very inception of philosophy, which may be disguised in a thousand different garbs by professorial clowns, but which can no more become antiquated than the question whether the source of human cognition is sight and touch, hearing and smell. To regard our sensations as images of the external world, to recognise objective truth, to hold the materialist theory of knowledge—these are all one and the same thing. To illustrate this, I shall only quote from Feuerbach and from two textbooks of philosophy, in order that the reader may judge how elementary this question is.

"How banal," wrote Feuerbach, "to deny that sensation is the evangel, the gospel *(Verkündung)* of an objective saviour."[1] A strange, a preposterous terminology, as you see, but a perfectly clear philosophical line: sensation reveals objective truth to man. "My sensation is subjective, but its foundation [or ground—*Grund*] is objective" (S. 195). Compare this with the quotation given above where Feuerbach says that materialism regards the perceptual world as the ultimate *(ausgemachte)* objective truth.

Sensationalism, we read in Franck's dictionary of philosophy,[2] is a doctrine which deduces all our ideas "from the experience of sense-organs, reducing all knowledge to sensations." There is subjective sensationalism (scepticism and Berkeleianism), moral sensationalism (Epicureanism), and objective sensationalism. "Objective sensationalism is nothing but materialism, for matter or bodies are, in the opinion of the materialists, the only objects that can affect our senses *(atteindre nos sens)*."

"If sensationalism," says Schwegler in his history of philosophy,[3] "asserted that truth or being can be apprehended exclusively by means of the senses, one had only [Schwegler is speaking of philosophy at the end of the eighteenth century in France] to formulate this proposition objectively and one had the thesis of materialism: only the perceptual exists; there is no other being save material being."

These elementary truths, which have managed to find their way even into the textbooks, have been forgotten by our Machians.

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[1] Feuerbach, *Sämtliche Werke*, Bd. X, 1866, S. 194-95.

[2] *Dictionnaire des sciences philosophiques*, Paris, 1875.

[3] Dr. Albert Schwegler, *Geschichte der Philosophie im Umriß*, 15. Aufl., S. 194.

5. ABSOLUTE AND RELATIVE TRUTH, OR THE ECLECTICISM OF ENGELS AS DISCOVERED BY BOGDANOV

Bogdanov made his discovery in 1906, in the preface to Book III of his *Empirio-Monism*. "Engels in *Anti-Dühring,*" writes Bogdanov, "expresses himself *almost* in the same sense in which I have just described the relativity of truth . . ." (p. v) (that is, in the sense of denying all eternal truth, "denying the unconditional objectivity of all truth whatsoever"). "Engels is wrong in his indecision, in the fact that in spite of his irony he recognises certain eternal truths, wretched though they may be . . ." (p. viii). "Only inconsistency can here permit such eclectic reservations as those of Engels . . ." (p. ix). Let us cite one instance of Bogdanov's refutation of Engels' eclecticism. "Napoleon died on May 5, 1821," says Engels in *Anti-Dühring,* in the chapter "Eternal Truths," where he reminds Dühring of the "platitudes" *(Plattheiten)* to which he who claims to discover eternal truths in the historical sciences has to confine himself. Bogdanov thus answers Engels: "What sort of 'truth' is that? And what is there 'eternal' about it? The recording of a single correlation, which perhaps even has no longer any real significance for our generation, cannot serve as a basis for any activity, and leads nowhere" (p. ix). And on page viii: "Can *Plattheiten* be called *Wahrheiten*? Are 'platitudes' truths? Truth is a vital organising form of experience; it *leads* us somewhere in our activity and provides a point of support in the struggle of life."

It is quite clear from these two quotations that Bogdanov, instead of refuting Engels, makes a mere *declamation.* If you cannot assert that the proposition "Napoleon died on May 5, 1821," is false or inexact, you acknowledge that it is true. If you do not assert that it may be refuted in the future, you acknowledge this truth to be eternal. But to call phrases such as truth is a "vital organising form of experience" an answer, is to palm off a mere *jumble of words* as philosophy. Did the earth have the history which is expounded in geology, or was the earth created in seven days?

Is one to be allowed to dodge this question by talking about "vital" (what does that mean?) truth which "leads" somewhere, and the like? Can it be that knowledge of the history of the earth and of the history of humanity "has no real significance"? That is just turgid nonsense, used by Bogdanov to cover his *retreat*. For it is a retreat, when, having taken it upon himself to prove that the admission of eternal truths by Engels is eclecticism, he dodges the issue by a noise and clash of words and leaves unrefuted the fact that Napoleon did die on May 5, 1821, and that to regard this *truth* as refutable in the future is absurd.

The example given by Engels is elementary, and anybody without the slightest difficulty can think of scores of similar *truths* that are eternal and absolute and that only insane people can doubt (as Engels says, citing another example: "Paris is in France"). Why does Engels speak here of "platitudes"? Because he refutes and ridicules the dogmatic, metaphysical materialist Dühring, who was incapable of applying dialectics to the relation between absolute and relative truth. To be a materialist is to acknowledge objective truth, which is revealed to us by our sense-organs. To acknowledge objective truth, *i.e.*, truth not dependent upon man and mankind, is, in one way or another, to recognise absolute truth. And it is this "one way or another" which distinguishes the metaphysical materialist Dühring from the dialectical materialist Engels. On the most complex questions of science in general, and of historical science in particular, Dühring scattered words right and left: ultimate, final and eternal truth. Engels jeered at him. Of course there are eternal truths, Engels said, but it is unwise to use high-sounding words *(gewaltige Worte)* in connection with simple things. If we want to advance materialism, we must drop this trite play with the words "eternal truth"; we must learn to put, and answer, the question of the relation between absolute and relative truth dialectically. It was on this issue that the fight between Dühring and Engels was waged thirty years ago. And Bogdanov, who managed *"not to notice"* Engels' explanation of the problem of absolute and relative truth given in *the very same chapter,* and who managed to accuse Engels of "eclecticism" for his admission of a proposition which is a truism for *all* forms of materialism, only once again betrays his utter ignorance of both materialism and dialectics.

"...Now we come to the question," Engels writes in *Anti-Dühring,* in the beginning of the chapter mentioned (Part I, Chap. IX), "whether any, and if so which, products of human knowledge ever can have sovereign validity and an unconditional claim *(Anspruch)* to truth" (*op. cit.*, p. 99). And Engels answers the question thus:

"...The sovereignty of thought is realised in a number of extremely unsovereignly-thinking human beings; the knowledge which has an unconditional claim to truth is realised in a number of relative errors; neither the one nor the other [*i.e.,* neither the absolute truth of knowledge, nor the sovereignty of thought] can be fully realised except through an endless eternity of human existence.

"Here once again we find the same contradiction as we found above, between the character of human thought, necessarily conceived as absolute, and its reality in individual human beings with their extremely limited thought. This is a contradiction which can only be solved in the infinite progression, or what is for us, at least from a practical standpoint, the endless succession, of generations of mankind. In this sense human thought is just as much sovereign as not sovereign, and its capacity for knowledge just as much unlimited as limited. It is sovereign and unlimited in its disposition *(Anlage),* its vocation, its possibilities and its historical goal; it is not sovereign and it is limited in its individual expression and in its realisation at each particular moment."[1]

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[1] *Cf.* V. Chernov, *loc. cit.*, p. 64, *et seq.* Chernov, the Machian, fully shares the position of Bogdanov who does not wish to own himself a Machian. The difference is that Bogdanov *tries to cover up* his disagreement with Engels, to present it as a casual matter, etc., while Chernov feels that it is a question of a struggle against both materialism and dialectics.

"It is just the same," Engels continues, "with eternal truths" (p. 100).

This argument is extremely important for the question of *relativism, i.e.,* the principle of the relativity of our knowledge, which is stressed by all Machians. The Machians *one and all* insist that they are relativists, but the Russian Machians, while repeating the words of the Germans, are afraid, or unable to propound the question of the relation of relativism to dialectics clearly and straightforwardly. For Bogdanov (as for all the Machians) the recognition of the relativity of our knowledge *excludes* even the least admission of absolute truth. For Engels absolute truth is compounded from relative truths. Bogdanov is a relativist; Engels is a dialectician. Here is another, no less important, argument of Engels from the chapter of *Anti-Dühring* already quoted:

"... Truth and error, like all concepts which are expressed in polar opposites, have absolute validity only in an extremely limited field, as we have just seen, and as even Herr Dühring would realise if he had any acquaintance with the first elements of dialectics, which deal precisely with the inadequacy of all polar opposites. As soon as we apply the antithesis between truth and error outside of that narrow field which has been referred to above it becomes relative and therefore unserviceable for exact scientific modes of expression; and if we attempt to apply it as absolutely valid outside that field we then really find ourselves beaten: both poles of the antithesis become transformed into their opposites, truth becomes error and error truth" (p. 104). Here follows the example of Boyle's law (the volume of a gas is inversely proportional to its pressure). The "grain of truth" contained in this law is only absolute truth within certain limits. The law, it appears, is a truth "only approximately."

Human thought then by its nature is capable of giving, and does give, absolute truth, which is compounded of a sum-total of relative truths. Each step in the development of science adds new grains to the sum of absolute truth, but the limits of the truth of each scientific proposition are relative, now expanding, now shrinking with the growth of knowledge. "Absolute truth," says Dietzgen in his *Streifzügen eines Sozialisten,* "can be seen, heard, smelt, touched and, of course, also be *known*; but it is not entirely absorbed *(geht nicht auf)* into knowledge" (p. 195). "It goes without saying that a picture does not exhaust its object and the artist remains behind his model.... How can a picture 'coincide' with its model? Approximately it can" (p. 197). "Hence, we can know nature and her parts only relatively; since even a part, though only a relation of nature, possesses nevertheless the nature of the absolute, the nature of nature as a whole *(des Naturganzen an sich)* which cannot be exhausted by knowledge.... How, then, do we know that behind the phenomena of nature, behind the relative truths, there is a universal, unlimited, absolute nature which does not reveal itself to man completely?... Whence this knowledge? It is innate; it is given us with consciousness" (p. 198). This last statement is one of the inexactitudes of Dietzgen's which led Marx, in one of his letters to Kugelmann, to speak of the confusion in Dietzgen's views. Only by seizing upon such incorrect passages can one speak of a specific philosophy of Dietzgen differing from dialectical materialism. But Dietzgen corrects himself *on the same page*: "When I say that the consciousness of eternal, absolute truth is innate in us, that it is the one and only *a priori* knowledge, experience also confirms this innate consciousness" (p. 198).

From all these statements by Engels and Dietzgen it is obvious that for dialectical materialism there is no impassable boundary between relative and absolute truth. Bogdanov entirely failed to grasp this if he could write: "It [the world outlook of the old materialism] sets itself up as the absolute *objective knowledge of the essence of things* [Bogdanov's italics] and is incompatible with the historically conditional nature of all ideologies" (*Empirio-Monism,* Bk. III, p. iv). From the standpoint of modern materialism *i.e.,* Marxism, the *limits* of approximation of our knowledge to the objective, absolute truth are historically conditional, but the existence of such truth is *unconditional,* and the fact that we are approaching nearer to it is also unconditional. The contours of the picture are historically conditional, but the fact that this picture depicts an objectively existing model is unconditional. When and under what circumstances we reached, in our knowledge of the essential nature of things, the discovery of alizarin in coal tar or the discovery of electrons in the atom is historically conditional; but that every such discovery is an advance of "absolutely objective knowledge" is unconditional. In a word, every ideology is historically conditional, but it is unconditionally true that to every scientific ideology (as distinct, for instance, from religious ideology), there corresponds an objective truth, absolute nature. You will say that this distinction between relative and absolute truth is indefinite. And I shall reply: yes, it is sufficiently "indefinite" to prevent science from becoming a dogma in the bad sense of the term, from becoming something dead, frozen, ossified; but it is at the same time sufficiently "definite" to enable us to dissociate ourselves in the most emphatic and irrevocable manner from fideism and agnosticism, from philosophical idealism and the sophistry of the followers of Hume and Kant. Here is a boundary which you have not noticed, and not having noticed it, you have fallen into the swamp of reactionary philosophy. It is the boundary between dialectical materialism and relativism.

We are relativists, proclaim Mach, Avenarius and Petzoldt. We are relativists, echo Mr. Chernov and certain Russian Machians, would-be Marxists. Yes, Mr. Chernov and Comrades Machians—and therein lies your error. For to make relativism the basis of the theory of knowledge is inevitably to condemn oneself either to absolute scepticism, agnosticism and sophistry, or to subjectivism. Relativism as the basis of the theory of knowledge is not only the recognition of the relativity of our knowledge, but also a denial of any objective measure or model existing independently of humanity to which our relative knowledge approximates. From the standpoint of naked relativism one can justify any sophistry; one may regard as "conditional" whether

Napoleon died on May 5, 1821, or not; one may declare the admission, alongside of scientific ideology ("convenient" in one respect), of religious ideology (very "convenient" in another respect) a mere "convenience" for man or humanity, and so forth.

Dialectics—as Hegel in his time explained—*contains* an element of relativism, of negation, of scepticism, but *is not reducible* to relativism. The materialist dialectics of Marx and Engels certainly does contain relativism, but is not reducible to relativism, that is, it recognises the relativity of all our knowledge, not in the sense of the denial of objective truth, but in the sense of the historically conditional nature of the limits of the approximation of our knowledge of this truth.

Bogdanov writes in italics: *"Consistent Marxism does not admit such dogmatism and such static concepts"* as eternal truths. (*Empirio-Monism*, Bk. III, p. ix.) This is a muddle. If the world is eternally moving and developing matter (as the Marxists think), reflected by the developing human consciousness, what is there "static" here? The point at issue is not the immutable essence of things, or an immutable consciousness, but the *correspondence* between the consciousness which reflects nature and the nature which is reflected by consciousness. In connection with this question, and this question alone, the term "dogmatism" has a specific, characteristic, philosophical flavour: it is a favourite word used by the idealists and the agnostics *against* the materialists, as we have already seen in the case of the fairly "old" materialist, Feuerbach. The objections brought against materialism from the standpoint of the celebrated "recent positivism" are just such ancient trash.

6. THE CRITERION OF PRACTICE IN THE THEORY OF KNOWLEDGE

We have seen that Marx in 1845 and Engels in 1888 and 1892 placed the criterion of practice at the basis of the materialist theory of knowledge. "The dispute over the reality or non-reality of thinking which is isolated from practice is a purely scholastic question," says Marx in his second Thesis on Feuerbach. The best refutation of Kantian and Humean agnosticism as well as of other philosophical fancies (*Schrullen*) is practice, repeats Engels. "The success of our actions proves the correspondence (*Uebereinstimmung*) of our perceptions with the objective nature of the things perceived," he says in reply to the agnostics.

Compare this with Mach's argument about the criterion of practice: "In the common way of thinking and speaking 'appearance' is usually contrasted with 'reality.' A pencil held in front of us in the air is seen as straight; when we dip it slantwise into water we see it as crooked. In the latter case we say that the pencil *appears* crooked, but in reality it is straight. But what entitles us to declare one fact to be the reality, and to degrade the other to an appearance?... Our expectation is deceived when... we fall into the natural error of expecting what we are accustomed to although the case is unusual. The facts are not to blame for that. In these cases, to speak of 'appearance' may have a practical significance, but not a scientific significance. Similarly, the question which is often asked, whether the world is real or whether we merely dream it, is devoid of all scientific significance. Even the wildest dream is a fact as much as any other" (*Analyse der Empfindungen*, S. 18-19).

It is true that not only is the wildest dream a fact, but also the wildest philosophy. No doubt of this is possible after an acquaintance with the philosophy of Ernst Mach. Egregious sophist that he is, he confounds the natural-historical and psychological investigation of human errors, of every "wild dream" of humanity, such as belief in sprites, hobgoblins, and so forth, with the epistemological distinction between truth and "wildness." It is as if an economist were to say that both Senior's theory[1] that the whole profit of the capitalist is obtained from the "last hour" of the worker's labour and Marx's theory are both facts, and that from the standpoint of science there is no point in asking which theory expresses objective truth and which—the prejudice of the bourgeoisie and the venality of its professors. The tanner Joseph Dietzgen regarded the scientific, *i.e.*, the materialist, theory of knowledge as a "universal weapon against religious belief" (*Kleinere philosophische Schriften*, S. 55), but for the professor-in-ordinary Ernst Mach a distinction between the materialist and the subjective-idealist theories of knowledge "is devoid of all scientific significance"! That science is non-partisan in the struggle of materialism against idealism and religion is a favourite idea not only of Mach but of all modern bourgeois professors, who are, as Dietzgen justly expresses it, "graduated flunkeys who stupefy the people by their twisted idealism" (*op. cit.*, p. 53).

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[1] See Karl Marx, *Capital*, Vol. I, Chap. IX, sec. 3.—*Trans.*

And a twisted professorial idealism it is, indeed, when the criterion of practice, which for every one of us distinguishes illusion from reality, is removed by Mach from the realm of science, from the realm of the theory of knowledge. Human practice proves the correctness of the materialist theory of knowledge, said Marx and Engels, who dubbed all attempts to solve the fundamental question of epistemology without the aid of practice "scholastic" and "philosophical fancies." But for Mach practice is one thing and the theory of knowledge another. They can be placed side by side without making the latter conditional on the former. In his last work, *Erkenntnis und Irrtum*, Mach says: "Knowledge is ... a biologically useful *(förderndes)* psychical experience" (p. 115 of the second German edition). "Only success can separate knowledge from error ..." (p. 116). "The concept is a physical working hypothesis" (p. 143). In their astonishing naïveté our Russian Machian would-be Marxists regard such phrases of Mach's as proof that he *comes close* to Marxism. But Mach here comes just as close to Marxism as Bismarck to the labour movement, or Bishop Eulogius to democracy. With Mach such propositions *stand side by side* with his idealist theory of knowledge and do not determine the choice of one or another definite line of epistemology. Knowledge can be useful biologically, useful in human practice, useful for the preservation of life, for the preservation of the species, only when it reflects an objective truth independent of man. For the materialist the "success" of human practice proves the correspondence between our ideas and the objective nature of the things we perceive. For the solipsist "success" is everything needed *by me in practice,* which can be regarded separately from the theory of knowledge. If we include the criterion of practice in the foundation of the theory of knowledge we inevitably arrive at materialism, says the Marxist. Let practice be materialist, says Mach, but theory is another matter.

"In practice," Mach writes in the *Analyse der Empfindungen,* "we can as little do without the idea of the *self* when we perform any act, as we can do without the idea of a body when we grasp at a thing. Physiologically we remain egoists and materialists with the same constancy as we forever see the sun rising again. But theoretically this view cannot be adhered to" (p. 291).

Egoism is beside the point here, for egoism is not an epistemological category. The question of the apparent movement of the sun around the earth is also beside the point, for in practice, which serves us as a criterion in the theory of knowledge, we must include also the practice of astronomical observations, discoveries, etc. There remains only Mach's valuable admission that in their practical life men are entirely and exclusively guided by the materialist theory of knowledge; the attempt to obviate it "theoretically" is characteristic of Mach's *gelehrte* scholastic and twisted idealistic endeavours.

To what extent these efforts to eliminate practice—as something unsusceptible to epistemological treatment—in order to make room for agnosticism and idealism are not new is shown by the following example from the history of German classical philosophy. Between Kant and Fichte stands G. E. Schulze (known in the history of philosophy as Schulze-Aenesidemus). He openly advocates the sceptical trend in philosophy and calls himself a follower of Hume (and of the ancients Pyrrho and Sextus). He emphatically rejects every thing-in-itself and the possibility of objective knowledge, and emphatically insists that we should not go beyond "experience," beyond sensations, in which connection he anticipates the following objection from the other camp: "Since ... the sceptic ... when he ... takes part in the affairs of life assumes as indubitable the reality of objective things, behaves accordingly, and thus admits a criterion of truth, his own behaviour is the best and clearest refutation of his scepticism."[1] "Such proofs," Schulze indignantly retorts, "are only valid for the mob" (p. 254). For "my scepticism does not concern the requirements of practical life, but remains within the bounds of philosophy" (p. 255).

In similar manner, the subjective idealist Fichte also hopes to find room within the bounds of idealistic philosophy for that "realism which is inevitable *(sich aufdringt)* for all of us, and even for the most determined idealist, when it comes to action, *i.e.*, the assumption that objects exist quite independently of us and outside us" (*Werke,* I, S. 455).

Mach's recent positivism has not travelled far from Schulze and Fichte! Let us note as a curiosity that on this question too for Bazarov there is no one but Plekhanov—there is no beast stronger than the cat. Bazarov ridicules the "*salto vitale* philosophy of Plekhanov" (*Studies,* etc., p. 69), who indeed made the absurd remark, that "belief" in the existence of the outer world "is an inevitable *salto vitale*" (vital leap) of philosophy (*Notes on Ludwig Feuerbach,* p. 111). The word "belief," although put in quotation marks (taken from Hume), discloses a confusion of terms on Plekhanov's part. There can be no question about that. But what has Plekhanov got to do with it? Why did not Bazarov take some other materialist, Feuerbach, for instance? Is it only because he does not know him? But ignorance is no argument. Feuerbach also, like Marx and Engels, makes an impermissible—from the point of view of Schulze, Fichte and Mach—"leap" to practice in the fundamental problems of epistemology. Criticising idealism, Feuerbach explains its essential nature by the following striking quotation from Fichte, which superbly demolishes Machism: " 'You assume,' writes Fichte, 'that things are real, that they exist outside of you, only because you see them, hear them and touch them. But vision, touch and hearing are only sensations.... You perceive, not the objects, but only your sensations' " (Feuerbach, *Werke,* Bd. X, S. 185). To which Feuerbach replies that a human being is not an abstract ego, but either a man or woman, and the question whether the world is sensation can be compared to the question: is the man or woman my sensation, or do our relations in practical life prove the contrary? "That is the fundamental defect of idealism: it asks and answers the question of objectivity and subjectivity, of the reality or unreality of the world, only from the standpoint of theory" (*ibid.,* p. 189). Feuerbach makes the sum-total of human practice the basis of the theory of knowledge. He says that idealists of course also recognise the reality of the *I* and the *Thou* in practical life. For the idealists "this point of view is valid only for practical life and not for speculation. But a speculation which contradicts life, which makes the standpoint of death, of a soul separated from the body, the standpoint of truth, is a dead and false speculation" (p. 192). Before we *perceive,* we breathe; we cannot exist without air, food and drink.

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[1] G. E. Schulze, *Aenesidemus oder über die Fundamente der von dem Herrn Professor Reinhold in Jena gelieferten Elementarphilosophie,* 1792, S. 253.

"Does this mean that we must deal with questions of food and drink when examining the problem of the ideality or reality of the world?—exclaims the indignant idealist. How vile! What an offence against good manners soundly to berate materialism in the scientific sense from the chair of philosophy and the pulpit of theology, only to practice materialism with all one's heart and soul in the crudest form at the table d'hôte" (p. 196). And Feuerbach exclaims that to identify subjective sensation with the objective world "is to identify pollution with procreation" (p. 198).

A comment not of the politest order, but it hits the vital spot of those philosophers who teach that sense-perception is the reality existing outside us.

The standpoint of life, of practice, should be first and fundamental in the theory of knowledge. And it inevitably leads to materialism, brushing aside the endless fabrications of professorial scholasticism. Of course, we must not forget that the criterion of practice can never, in the nature of things, either confirm or refute any human idea *completely*. This criterion also is sufficiently "indefinite" not to allow human knowledge to become "absolute," but at the same time it is sufficiently definite to wage a ruthless fight on all varieties of idealism and agnosticism. If what our practice confirms is the sole, ultimate and objective truth, then from this must follow the recognition that the only path to this truth is the path of science, which holds the materialist point of view. For instance, Bogdanov is prepared to recognise Marx's theory of the circulation of money as an objective truth only for "our time," and calls it "dogmatism" to attribute to this theory a "super-historically objective" truth (*Empirio-Monism,* Bk. III, p. vii). This is again a muddle. The correspondence of this theory to practice cannot be altered by any future circumstances, for the same simple reason that makes it an *eternal* truth that Napoleon died on May 5, 1821. But inasmuch as the criterion of practice, *i.e.*, the course of development of *all* capitalist countries in the last few decades, proves only the objective truth of Marx's *whole* social and economic theory in general, and not merely of one or other of its parts, formulations, etc., it is clear that to talk of the "dogmatism" of the Marxists is to make an unpardonable concession to bourgeois economics. The sole conclusion to be drawn from the opinion of the Marxists that Marx's theory is an objective truth is that by following the *path* of Marxian theory we shall draw closer and closer to objective truth (without ever exhausting it); but by following *any other path* we shall arrive at nothing but confusion and lies.

CHAPTER THREE

THE THEORY OF KNOWLEDGE OF DIALECTICAL MATERIALISM AND EMPIRIO-CRITICISM. III

1. WHAT IS MATTER? WHAT IS EXPERIENCE?

The first of these questions is constantly being hurled by the idealists and agnostics, including the Machians, at the materialists; the second question by the materialists at the Machians. Let us try to make the point at issue clear.

Avenarius says on the subject of matter:

"Within the purified, 'complete experience' there is nothing 'physical'—'matter' in the metaphysical absolute conception—for 'matter' according to this conception is only an abstraction; it would be the total of the counter-terms abstracted from every central term. Just as in the principal co-ordination, that is, 'complete experience,' a counter-term is inconceivable *(undenkbar)* without a central term, so matter in the absolute metaphysical conception is a complete chimera *(Unding)*" (*Bemerkungen,* § 119).

In all this gibberish one thing is evident, namely, that Avenarius designates the physical or matter by the terms absolute and metaphysics, for, according to his theory of the principal co-ordination (or, in the new way, "complete experience"), the counter-term is inseparable from the central term, the environment from the *self*; the *non-self* is inseparable from the *self* (as J. G. Fichte said). That this theory is disguised subjective idealism we have already shown, and the nature of Avenarius' attacks on "matter" is quite obvious: the idealist denies physical being that is independent of the psychical and therefore rejects the concept elaborated by philosophy for such being. That matter is "physical" (*i.e.,* that which is most familiar and immediately given to man, and the existence of which no one save an inmate of a lunatic asylum can doubt) is not denied by Avenarius; he only insists on the acceptance of *"his"* theory of the indissoluble connection between the environment and the self.

Mach expresses the same thought more simply, without philosophical flourishes: "What we call matter is a certain systematic combination of the *elements* (sensations)" (*Analyse der Empfindungen,* S. 270). Mach thinks that by this assertion he is effecting a "radical change" in the usual world outlook. In reality this is the old, old subjective idealism, the nakedness of which is concealed by the word "element."

And lastly, the English Machian, Pearson, a rabid antagonist of materialism, says: "Now there can be no scientific objection to our classifying certain more or less permanent groups of sense-impressions together and terming them matter,—to do so indeed leads us very near to John Stuart Mill's definition of matter as a 'permanent possibility of sensation,' —but this definition of matter then leads us entirely away from matter as the thing which moves" (*The Grammar of Science,* 2nd ed., 1900, p. 249). Here there is not even the fig-leaf of the "elements," and the idealist openly stretches out a hand to the agnostic.

As the reader sees, all these arguments of the founders of empirio-criticism entirely and exclusively revolve around the old epistemological question of the relation of thinking to being, of sensation to the physical. It required the extreme naïveté of the Russian Machians to discern anything here that is even remotely related to "recent science," or "recent positivism." All the philosophers mentioned by us, some frankly, others guardedly, replace the fundamental philosophical line of materialism (from being to thinking, from matter to sensation) by the reverse line of idealism. Their denial of matter is the old answer to epistemological problems, which consists in denying the existence of an external, objective source of our sensations, of an objective reality corresponding to our sensations. On the other hand, the recognition of the philosophical line denied by the idealists and agnostics is expressed in the definitions: matter is that which, acting upon our sense-organs, produces sensation; matter is the objective reality given to us in sensation, and so forth.

Bogdanov, pretending to argue only against Beltov and cravenly ignoring Engels, is indignant at such definitions, which, don't you see, "prove to be simple repetitions" (*Empirio-Monism,* Bk. III, p. xvi) of the "formula" (*of Engels,* our "Marxist" forgets to add) that for one trend in philosophy matter is primary and spirit secondary, while for the other trend the reverse is the case. All the Russian Machians exultantly echo Bogdanov's "refutation"! But the slightest reflection could have shown these people that it is impossible, in the very nature of the case, to give any definition of these two latter concepts of epistemology save one that indicates which of them is taken as primary. What is meant by giving a "definition"? It means essentially to bring a given concept within a more comprehensive concept. For example, when I give the definition "an ass is an animal," I am bringing the concept "ass" within a more comprehensive concept. The question then is, are there more comprehensive concepts, with which the theory of knowledge could operate, than those of being and thinking, matter and sensation, physical and psychical? No. These are the ultimate concepts, the most comprehensive concepts, which epistemology has in point of fact so far not surpassed (apart from changes in *nomenclature,* which are *always* possible). One must be a charlatan or an utter blockhead to demand a "definition" of these two "series" of concepts of ultimate comprehensiveness which would not be a "mere repetition": one or the other must be taken as the primary. Take the three afore-mentioned arguments on matter. What do they all amount to? To this, that these philosophers proceed from the psychical, or self, to the physical, or environment, as from the central term to the counter-term—or from sensation to matter, or from sense-perception to matter. Could Avenarius, Mach and Pearson in fact have given any other "definition" of these fundamental concepts, save by pointing to the *trend* of their philosophical line? Could they have defined in any other way, in any specific way, what the *self* is, what sensation is, what sense-perception is? One has only to formulate the question clearly to realise what utter nonsense the Machians are talking when they demand that the materialists give a definition of matter which would not amount to a repetition of the proposition that matter, nature, being, the physical—is primary, and spirit, consciousness, sensation, the psychical—is secondary.

One expression of the genius of Marx and Engels was that they despised pedantic playing with new words, erudite terms, and subtle "isms," and that they said simply and plainly: there is a materialist line and an idealist line in philosophy, and between them there are various shades of agnosticism. The painful quest for a "new" point of view in philosophy betrays the same poverty of spirit that is revealed in the painful effort to create a "new" theory of value, or a "new" theory of rent, and so forth.

Of Avenarius, his disciple Carstanjen says that he once expressed himself in private conversation as follows: "I know neither the physical nor the psychical, but only some third." To the remark of one writer that the concept of this third was not given by Avenarius, Petzoldt replied: "We know why he could not advance such a concept. The third lacks a counter-concept *(Gegenbegriff)*. . . . The question, what is the third? is illogically put."[1] Petzoldt understands that the latter concept cannot be defined. But he does not understand that the resort to a "third" is a mere subterfuge, for every one of us knows what is physical and what is psychical, but none of us knows at present what that "third" is. Avenarius was merely covering up his tracks by this subterfuge and *actually* was declaring that the self is the primary (central term) and nature (environment) the secondary (counter-term).

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[1] *Einführung in die Philosophie der reinen Erfahrung,* Bd. II, S. 329.

Of course, even the antithesis of matter and mind has absolute significance only within the bounds of a very limited field—in this case exclusively within the bounds of the fundamental epistemological problem of what is to be regarded as primary and what as secondary. Beyond these bounds the relative character of this antithesis is indubitable.

Let us now examine how the word "experience" is used in empirio-critical philosophy. The first paragraph of the *Kritik der reinen Erfahrung* expounds the following "assumption": "Any part of our environment stands in relation to human individuals in such a way that, the former having been given, the latter speak of their experience as follows: 'this is experienced,' 'this is an experience'; or 'it followed from experience,' or 'it depends upon experience.' " Thus experience is defined in terms of these same concepts: *self* and environment; while the "doctrine" of their "indissoluble" connection is for the time being kept out of the way. Further: "The synthetic concept of pure experience"—namely, experience "as a predication, for which, in all its components only parts of the environment serve as a premise" (pp. 3 and 4). If we assume that the environment exists independently of "declarations" and "predications" of man, then it becomes possible to interpret experience in a materialist way! "The analytical concept of pure experience"—"namely, as a predication to which nothing is admixed that would not be in its turn experience and which, therefore, in itself is nothing but experience" (p. 5). Experience is experience. And there are people who take this quasi-erudite rigmarole for true wisdom!

It is essential to add that in the second volume of the *Kritik der reinen Erfahrung* Avenarius regards "experience" as a "special case of the *psychical*; that he divides experience into *sachhafte Werte* (thing-values) and *gedankenhafte Werte* (thought-values); that "experience in the broad sense" includes the latter; that "complete experience" is identified with the principal co-ordination (*Bemerkungen*, etc.). In short, you pay your money and take your choice. "Experience" embraces both the materialist and the idealist trend in philosophy and sanctifies the muddling of them. But while our Machians confidingly accept "pure experience" as pure coin of the realm, in philosophical literature the representatives of the various trends are alike in pointing to Avenarius' abuse of this concept. "What pure experience is," A. Riehl writes, "remains vague with Avenarius, and his explanation that 'pure experience is experience to which nothing is admixed that is not in its turn experience' is obviously a vicious circle" (*Systematische Philosophie*, Leipzig, 1907, S. 102). Pure experience for Avenarius, writes Wundt, is at times any kind of fantasy, and at others, a predication with the character of "corporeality" (*Philosophische Studien*, Bd. XIII, S. 92-93). Avenarius *stretches* the concept experience (S. 382). "On the precise definition of the terms experience and pure experience," writes Couwelaert, "depends the meaning of the whole of this philosophy. Avenarius does not give these precise definitions" (*Revue néo-scholastique*, février 1907, p. 61). "The vagueness of the term 'experience' stands him in good stead, and so in the end Avenarius falls back on the timeworn argument of subjective idealism" (under the pretence of combating it), says Norman Smith (*Mind*, Vol. XV, p. 29).

"I openly declare that the inner sense, the soul of my philosophy consists in this that a human being possesses nothing save experience; a human being comes to everything to which he comes only through experience...." A zealous philosopher of pure experience, is he not? The author of these words is the subjective idealist Fichte (*Sonnenklarer Bericht, usw.*, S. 12). We know from the history of philosophy that the interpretation of the concept experience divided the classical materialists from the idealists. Today professorial philosophy of all shades disguises its reactionary nature by declaiming on the subject of "experience." All the immanentists fall back on experience. In the preface to the second edition of his *Erkenntnis und Irrtum*, Mach praises a book by Professor Wilhelm Jerusalem in which we read: "The acceptance of a divine original being is not contradictory to experience" (*Der kritische Idealismus und die reine Logik*, S. 222).

One can only commiserate with people who believed Avenarius and Co.—who believed that the "obsolete" distinction between materialism and idealism can be surmounted by the word "experience." When Valentinov and Yushkevich accuse Bogdanov, who departed somewhat from pure Machism, of abusing the word experience, these gentlemen are only betraying their ignorance. Bogdanov is "not guilty" in this case; he *only* slavishly borrowed the muddle of Mach and Avenarius. When Bogdanov says that "consciousness and immediate psychical experience are identical concepts..." (*Empirio-Monism*, Bk. II, p. 53) while matter is "not experience" but "the unknown which evokes everything known" (*Empirio-Monism*, Bk. III, p. xiii), he is interpreting experience *idealistically*. And, of course, he is not the first[1] nor the last to build petty idealist systems on the word experience. When he replies to the reactionary philosophers by declaring that attempts to transcend the boundaries of experience lead in fact only to "empty abstractions and contradictory images, all the elements of which have nevertheless been taken from experience" (Bk. I, p. 48), he is drawing a contrast between the empty abstractions of the human mind and something which exists outside of man and independently of his mind, in other words, he is interpreting experience as a materialist.

Similarly, even Mach, although he makes idealism his starting point (bodies are complexes of sensations or "elements") frequently strays into a materialist interpretation of the word experience. "We must not philosophise out of ourselves *(nicht aus uns herausphilosophieren)*, but must take from experience," he says in the *Mechanik* (3. Aufl., 1897, S. 14). Here a contrast is drawn between experience and philosophising out of ourselves, in other words, experience is regarded as something objective, something given to man from the outside; it is interpreted materialistically. Here is another example: "What we observe in nature is imprinted, although uncomprehended and unanalysed, upon our ideas, which, then, in their most general and strongest features imitate *(nachahmen)* the processes of nature. In these experiences we possess a treasure-store *(Schatz)* which is ever to hand..." (*op. cit.*, p. 27). Here nature is taken as primary and sensation and experience as products. Had Mach consistently adhered to this point of view in the fundamental questions of epistemology, he would have spared humanity many foolish idealist "complexes." A third example: "The close connection of thought and experience creates modern natural science. Experience gives rise to a thought. The latter is further elaborated and is again compared with experience..." (*Erkenntnis und Irrtum,* S. 200). Mach's special "philosophy" is here thrown overboard, and the author instinctively accepts the customary standpoint of the scientists, who regard experience materialistically.

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[1] In England Comrade Belfort Bax has been exercising himself in this way for a long time. A French reviewer of his book, *The Roots of Reality*, rather bitingly remarked: "Experience is only another word for consciousness; then come forth as an open idealist!" *(Revue de philosophie*, 1907, p. 399).

To summarise: the word "experience," on which the Machians build their systems, has long been serving as a shield for idealist systems, and is now serving Avenarius and Co. in eclectically passing to and fro between the idealist position and the materialist position. The various "definitions" of this concept are only expressions of those two fundamental lines in philosophy which were so strikingly revealed by Engels.

2. PLEKHANOV'S ERROR CONCERNING THE CONCEPT "EXPERIENCE"

On pages x-xi of his introduction to *L. Feuerbach* (1905 ed.) Plekhanov says:

"One German writer has remarked that for empiriocriticism *experience* is only an object of investigation, and not a means of knowledge. If that is so, then the distinction between empirio-criticism and materialism loses all meaning, and the discussion of the question whether or not empirio-criticism is destined to replace materialism is absolutely shallow and idle."

This is one complete muddle.

Fr. Carstanjen, one of the most "orthodox" followers of Avenarius, says in his article on empirio-criticism (a reply to Wundt), that "for the *Kritik der reinen Erfahrung* experience is not a means of knowledge but only an object of investigation."[1] It follows that according to Plekhanov any distinction between the views of Fr. Carstanjen and materialism is meaningless!

Fr. Carstanjen is almost literally quoting Avenarius, who in his *Bemerkungen* emphatically contrasts his conception of experience as that which is given us, that which we find *(das Vorgefundene)*, with the conception of experience as a "means of knowledge" in "the sense of the prevailing theories of knowledge, which essentially are fully metaphysical" (*op. cit.*, p. 401). Petzoldt, following Avenarius, says the same thing in his *Einführung in die Philosophie der reinen Erfahrung* (Bd. I, S. 170). Thus, according to Plekhanov, the distinction between the views of Carstanjen, Avenarius, Petzoldt and materialism is meaningless! Either Plekhanov has not read Carstanjen and Co. as thoroughly as he should, or he has taken his reference to "a German writer" at fifth hand.

What then does this statement, uttered by some of the most prominent empirio-criticists and not understood by Plekhanov, mean? Carstanjen wishes to say that Avenarius in his *Kritik der reinen Erfahrung* takes experience, *i.e.*, all "human predications," as the *object* of investigation. Avenarius does not investigate here, says Carstanjen (*op. cit.*, p. 50), whether these predications are real, or whether they relate, for example, to *ghosts*; he merely arranges, systematises, formally classifies all possible human predications, *both idealist and materialist* (p. 53), without going into the essence of the question. Carstanjen is absolutely right when he characterises *this* point of view as "scepticism par excellence" (p. 213). In this article, by the way, Carstanjen defends his beloved master from the ignominious (for a German professor) charge of materialism levelled against him by Wundt. Why are we materialists, pray?—such is the burden of Carstanjen's objections—when we speak of "experience" we do not mean it in the ordinary current sense, which leads or might lead to materialism, but in the sense that we investigate everything that men "predicate" as experience. Carstanjen and Avenarius regard the view that experience is a means of knowledge as materialistic (that, perhaps, is the most common opinion, but nevertheless, untrue, as we have seen in the case of Fichte). Avenarius entrenches himself against the "prevailing" "metaphysics" which persists in regarding the brain as the organ of thought and which ignores the theories of introjection and co-ordination. By the given or the found *(das Vorgefundene)*, Avenarius means the indissoluble connection between the self and the environment, which leads to a confused idealist interpretation of "experience."

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[1] *Vierteljahrsschrift für wissenschaftliche Philosophie*, Jahrg. 22, 1898, S. 45

Hence, both the materialist and the idealist, as well as the Humean and the Kantian lines in philosophy may unquestionably be concealed beneath the word "experience"; but neither the definition of experience as an object of investigation,[1] nor its definition as a means of knowledge is decisive in this respect. Carstanjen's remarks about Wundt especially have no relation whatever to the question of the distinction between empirio-criticism and materialism.

As a curiosity let us note that on this point Bogdanov and Valentinov, in their reply to Plekhanov, revealed no greater knowledge of the subject. Bogdanov declared: "It is not quite clear" (Bk. III, p. xi).—"It is the task of empirio-criticists to examine this formulation and to accept or reject the condition." A very convenient position: I, forsooth, am not a Machian and am not therefore obliged to find out in what sense a certain Avenarius or Carstanjen speaks of experience! Bogdanov wants to make use of Machism (and of the Machian confusion regarding "experience"), but he does not want to be held responsible for it.

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[1] Plekhanov perhaps thought that Carstanjen had said, "an object of knowledge independent of knowledge," and not an "object of investigation"? This would indeed be materialism. But neither Carstanjen, nor anybody else acquainted with empirio-criticism, said, or could have said, any such thing.

The "pure" empirio-criticist Valentinov transcribed Plekhanov's remark and publicly danced the cancan; he sneered at Plekhanov for not naming the author and for not explaining what the matter was all about (*op. cit.*, pp. 108-09). But at the same time this empirio-critical philosopher in his answer said *not a single word* on the substance of the matter, although acknowledging that he had read Plekhanov's remark "three times or more" (and had apparently not understood it). Oh, those Machians!

3. CAUSALITY AND NECESSITY IN NATURE

The question of causality is particularly important in determining the philosophical line of any new "ism," and we must therefore dwell on it in some detail.

Let us begin with an exposition of the materialist theory of knowledge on this point. L. Feuerbach's views are expounded with particular clarity in his reply to R. Haym already referred to.

"'Nature and human reason,' says Haym, 'are for him (Feuerbach) completely divorced, and between them a gulf is formed which cannot be spanned from one side or the other.' Haym grounds this reproach on § 48 of my *Essence of Religion* where it is said that 'nature may be conceived only through nature itself, that its necessity is neither human nor logical, neither metaphysical nor mathematical, that nature alone is the being to which it is impossible to apply any human measure, although we compare and give names to its phenomena, in order to make them comprehensible to us, and in general apply human expressions and conceptions to them, as for example: order, purpose, law; and are obliged to do so because of the character of our language.' What does this mean? Does it mean that there is no order in nature, so that, for example, autumn may be succeeded by summer, spring by winter, winter by autumn? That there is no purpose, so that, for example, there is no co-ordination between the lungs and the air, between light and the eye, between sound and the ear? That there is no law, so that, for example, the earth may move now in an ellipse, now in a circle, that it may revolve around the sun now in a year, now in a quarter of an hour? What nonsense! What then is meant by this passage? Nothing more than to distinguish between that which belongs to nature and that which belongs to man; it does not assert that there is actually nothing in nature corresponding to the words or ideas of order, purpose, law. All that it does is to deny the identity between thought and being; it denies that they exist in nature exactly as they do in the head or mind of man. Order, purpose, law are words used by man to translate the acts of nature into *his own* language in order that he may understand them. These words are not devoid of meaning or of objective content *(nicht-sinn-, d. h. gegenstandslose Worte)*; nevertheless, a distinction must be made between the original and the translation. Order, purpose, law in the human sense express something arbitrary.

"From the contingency of order, purpose and law in nature, theism expressly infers their arbitrary origin; it infers the existence of a being distinct from nature which brings order, purpose, law into a nature that is in itself *(an sich)* chaotic *(dissolute)* and indifferent to all determination. The reason of the theists . . . is reason contradictory to nature, reason absolutely devoid of understanding of the essence of nature. The reason of the theists splits nature into two beings—one material, and the other formal or spiritual" (*Werke*, Bd. VII, 1903, S. 518-20).

Thus Feuerbach recognises objective law in nature and objective causality, which are reflected only with approximate fidelity by human ideas of order, law and so forth. With Feuerbach the recognition of objective law in nature is inseparably connected with the recognition of the objective reality of the external world, of objects, bodies, things, reflected by our mind. Feuerbach's views are consistently materialistic. All other views, or rather, any other philosophical line on the question of causality, the denial of objective law, causality and necessity in nature, are justly regarded by Feuerbach as belonging to the fideist trend. For it is, indeed, clear that the subjectivist line on the question of causality, the deduction of the order and necessity of nature not from the external objective world, but from consciousness, reason, logic, and so forth, not only cuts human reason off from nature, not only opposes the former to the latter, but makes nature a *part* of reason, instead of regarding reason as a part of nature. The subjectivist line in the question of causality is philosophical idealism (varieties of which are the theories of causality of Hume and Kant), *i.e.*, fideism, more or less weakened and diluted. The recognition of objective law in nature and the recognition that this law is reflected with approximate fidelity in the mind of man is materialism.

As regards Engels, he had, if I am not mistaken, no occasion to contrast his materialist view with other trends on the particular question of causality. He had no need to do so, since he had definitely dissociated himself from all the agnostics on the more fundamental question of the objective reality of the external world in general. But to anyone who has read his philosophical works at all attentively it must be clear that Engels does not admit even the shadow of a doubt as to the existence of objective law, order, causality and necessity in nature. We shall confine ourselves to a few examples. In the first section of *Anti-Dühring* Engels says: "In order to understand these details [of the general picture of the world phenomena], we must detach them from their natural or historical connections, and examine each one separately, as to its nature, its special causes and effects, etc." (p. 27). That this natural connection, the connection between natural phenomena, exists objectively, is obvious. Engels particularly emphasises the dialectical view of cause and effect: "It is just the same with cause and effect; these are conceptions which only have validity in their application to a particular case as such, but when we consider the particular case in its general connection with the world as a whole they merge and dissolve in the conception of universal action and interaction, in which causes and effects are constantly changing places, and what is now or here an effect becomes there or then a cause, and *vice versa*" (p. 29). Hence, the human conception of cause and effect always somewhat simplifies the objective connection of the phenomena of nature, reflecting it only approximately, artificially isolating one or another aspect of a single world process. If we find that the laws of thought correspond with the laws of nature, says Engels, this becomes quite conceivable when we take into account that reason and consciousness are "products of the human brain and that man himself is a product of nature." Of course, "the products of the human brain, being in the last analysis also products of nature, do not contradict the rest of nature *(Naturzusammenhang)* but are in correspondence with it" (pp. 44-45). There is no doubt that there exists a natural, objective interconnection between the phenomena of the world. Engels constantly speaks of the "laws of nature," of the "necessities of nature" *(Naturnotwendigkeiten)*, without considering it necessary to explain the generally known propositions of materialism.

In *Ludwig Feuerbach* also we read that "the general laws of motion—both of the external world and of human thought—[are] two sets of laws which are identical in substance but differ in their expression in so far as the human mind can apply them consciously, while in nature and also up to now for the most part in human history, these laws assert themselves unconsciously in the form of external necessity in the midst of an endless series of seeming accidents (*op. cit.*, p. 54). And Engels reproaches the old natural philosophy for having replaced "the real but as yet unknown inter-connections" (of the phenomena of nature) by "ideal and imaginary ones" (p. 57). Engels' recognition of objective law, causality and necessity in nature is absolutely clear, as is his emphasis on the relative character of our, *i.e.*, man's, approximate reflections of this law in various concepts.

Passing to Joseph Dietzgen, we must first note one of the innumerable distortions committed by our Machians. One of the authors of *Studies "in" the Philosophy of Marxism,* Mr. Helfond, tells us: "The basic points of Dietzgen's world outlook may be summarised in the following propositions: . . . (9) The causal dependence which we ascribe to things is in reality not contained in the things themselves" (p. 248). *This is sheer nonsense.* Mr. Helfond, whose own views represent a veritable hash of materialism and agnosticism, *has outrageously falsified* J. Dietzgen. Of course, we can find plenty of confusion, inexactnesses and errors in Dietzgen; such as gladden the hearts of the Machians and oblige materialists to regard Dietzgen as a philosopher who is not entirely consistent. But to attribute to the materialist J. Dietzgen a direct denial of the materialist view of causality—only a Helfond, only the Russian Machians are capable of that.

"Objective scientific knowledge," says Dietzgen in his *Wesen der menschlichen Kopfarbeit* (German ed. 1903), "seeks for causes not by faith or speculation, but by experience and induction, not *a priori,* but *a posteriori.* Natural science looks for causes not outside or back of phenomena, but within or by means of them" (pp. 94-95). "Causes are the products of the faculty of thought. They are, however, not its pure products, but are produced by it in conjunction with sense material. This sense material gives the causes thus derived their objective existence. Just as we demand that a truth should be the truth of an objective phenomenon, so we demand that a cause should be real, that it should be the cause of some objective effect" (pp. 98-99). "The cause of the thing is its connection" (p. 100).

It is clear from this that Mr. Helfond has made a statement which is *directly contrary to fact.* The world outlook of materialism expounded by J. Dietzgen recognises that "the causal dependence" *is contained* "in the things themselves." It was necessary for the Machian hash that Mr. Helfond should confuse the materialist line with the idealist line on the question of causality.

Let us now proceed to the latter line.

A clear statement of the starting point of Avenarius' philosophy on this question is to be found in his first work, *Philosophie als Denken der Welt gemäß dem Prinzip des kleinsten Kraftmaßes.* In § 81 we read: "Just as we do not experience *(erfahren)* force as causing motion, so we do not experience the *necessity* for any motion.... All we experience *(erfahren)* is that the one follows the other." This is the Humean standpoint in its purest form: sensation, experience, tell us nothing of any necessity. A philosopher who asserts (on the principle of "the economy of thought") that only sensation exists could not have come to any other conclusion. "Since the idea of *causality,* "we read further," demands force and necessity or constraint as integral parts of the effect, so it falls together with the latter" (§ 82). "Necessity ... therefore expresses a particular degree of probability ... with which the effect is, or may be, expected" (§ 83, thesis).

This is outspoken subjectivism on the question of causality. And if one is at all consistent one cannot come to any other conclusion without recognising objective reality as the source of our sensations.

Let us turn to Mach. In a special chapter, "Causality and Explanation" (*Die Prinzipien der Wärmelehre,* 2. Auflage, 1900, S. 432-39), we read: "The Humean criticism (of the conception of causality) nevertheless retains its validity." Kant and Hume (Mach does not trouble to deal with other philosophers) solve the problem of causality differently. "We prefer" Hume's solution. "Apart from *logical* necessity [Mach's italics] no other necessity, for instance physical necessity, exists." This is exactly the view which was so vigorously combated by Feuerbach. It never even occurs to Mach to deny his kinship with Hume. Only the Russian

Machians could go so far as to assert that Hume's agnosticism could be "combined" with Marx's and Engels' materialism. In Mach's *Mechanik*, we read: "In nature there is neither cause nor effect" (S. 474, 3. Auflage, 1897). "I have repeatedly demonstrated that all forms of the law of causality spring from subjective motives *(Trieben)* and that there is no necessity for nature to correspond with them" (p. 495).

We must here note that our Russian Machians with amazing naïveté replace the question of the materialist or idealist trend of all arguments on the law of causality by the question of one or another formulation of this law. They believed the German empirio-critical professors that merely to say "functional correlation" was to make a discovery in "recent positivism" and to release one from the "fetishism" of expressions like "necessity," "law," and so forth. This of course is utterly absurd, and Wundt was fully justified in ridiculing such a *change of words* (in the article, quoted above, in *Philosophische Studien,* S. 383, 388), which in fact changes nothing. Mach himself speaks of "all forms" of the law of causality and in his *Erkenntnis und Irrtum* (2. Auflage, S. 278) makes the self-evident reservation that the concept function can express the "dependence of elements" more precisely only when the possibility is achieved of expressing the results of investigation in *measurable* quantities, which even in sciences like chemistry has only partly been achieved. Apparently, in the opinion of our Machians, who are so credulous as to professorial discoveries, Feuerbach (not to mention Engels) did not know that the concepts order, law, and so forth, can under certain conditions be expressed as a mathematically defined functional relation!

The really important epistemological question that divides the philosophical trends is not the degree of precision attained by our descriptions of causal connections, or whether these descriptions can be expressed in exact mathematical formulæ, but whether the source of our knowledge of these connections is objective natural law or properties of our mind, its innate faculty of apprehending certain *a priori* truths, and so forth. This is what so irrevocably divides the materialists Feuerbach, Marx and Engels from the agnostics (Humeans) Avenarius and Mach.

In certain parts of his works, Mach, whom it would be a sin to accuse of consistency, frequently "forgets" his agreement with Hume and his own subjectivist theory of causality and argues "simply" as a scientist, *i.e.*, from the instinctive materialist standpoint. For instance, in his *Mechanik*, we read of "the uniformity . . . which nature teaches us to find in its phenomena." (French ed., p. 182). But if we *do find* uniformity in the phenomena of nature, does this mean that uniformity exists objectively outside our mind? No. On the question of the uniformity of nature Mach also delivers himself thus: "The power that prompts us to complete in thought facts only partially observed is the power of association. It is greatly strengthened by repetition. It then appears to us to be a power which is independent of our will and of individual facts, a power which directs thoughts *and* [Mach's italics] facts, which keeps both in mutual correspondence as a *law* governing both. That we consider ourselves capable of making predictions with the help of such a law only [!] proves that there is sufficient uniformity in our environment, but it does not prove the *necessity* of the success of our predictions" (*Wärmelehre*, S. 383).

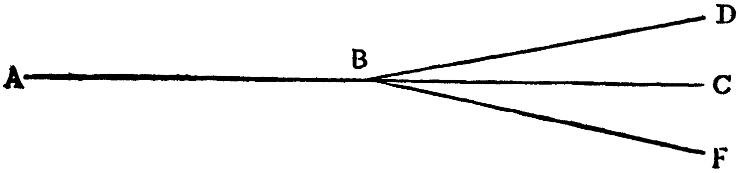
It follows that we may and ought to look for a necessity *apart from* the uniformity of our environment, *i.e.*, of nature! Where to look for it is the secret of idealist philosophy which is afraid to recognise man's perceptive faculty as a simple reflection of nature. In his last work, *Erkenntnis und Irrtum,* Mach even defines a law of nature as a "limitation of expectation" (2. Auflage, S. 450 ff.)! Solipsism claims its own.

Let us examine the position of other writers of the same philosophical trend. The Englishman, Karl Pearson, expresses himself with characteristic precision (*The Grammar of Science*, 2nd ed.): "The laws of science are products of the human mind rather than factors of the external world"

(p. 36). "Those, whether poets or materialists, who do homage to nature, as the sovereign of man, too often forget that the order and complexity they admire are at least as much a product of man's perceptive and reasoning faculties as are their own memories and thoughts" (p. 185). "The comprehensive character of natural law is due to the ingenuity of the human mind" *(ibid). "Man is the maker of natural law,"* it is stated in Chapter III, § 4. "There is more meaning in the statement that man gives laws to nature than in its converse that nature gives laws to man," although, the worthy professor is regretfully obliged to admit, the latter (materialist) view is "unfortunately far too common today" (p. 87). In the fourth chapter, which is devoted to the question of causality, Pearson formulates the following thesis (§ 11): *"The necessity lies in the world of conceptions" and not in the world of perceptions.* It should be noted that for Pearson perceptions or sense-impressions are *the* reality existing outside us. "In the uniformity with which sequences of perception are repeated (the routine of perceptions) there is also no inherent necessity, but it is a necessary condition for the existence of thinking beings that there should be a routine in the perceptions. The necessity thus lies in the nature of the thinking being and not in the perceptions themselves; thus it is conceivably a product of the perceptive faculty" (p. 139).

Our Machian, with whom Mach himself frequently expresses complete solidarity, thus arrives safely and soundly at pure Kantian idealism: it is man who dictates laws to nature and not nature that dictates laws to man! The important thing is not the repetition of Kant's doctrine of apriorism—which does not define the idealist line in philosophy as such, but only a particular formulation of this line—but the fact that reason, mind, consciousness are here primary, and nature secondary. It is not reason that is a part of nature, one of its highest products, the reflection of its processes, but nature that is a part of reason, which thereby is stretched from the ordinary, simple human reason known to us all to a "stupendous," as Dietzgen puts it, mysterious, divine reason. The Kantian-Machian formula, that "man gives laws to nature," is a fideist formula. If our Machians stare wide-eyed on reading Engels' statement that the fundamental characteristic of materialism is the acceptance of nature and not spirit as primary, it only shows how incapable they are of distinguishing the really important philosophical trends from the mock erudition and sage jargon of the professors.

J. Petzoldt, who in his two-volume work analysed and developed Avenarius, may serve as an excellent example of reactionary Machian scholasticism. "Even to this day," says he, "one hundred and fifty years after Hume, substantiality and causality paralyse the daring of the thinker" (*Einführung in die Philosophie der reinen Erfahrung,* Bd. I, S. 31). It goes without saying that those who are most "daring" are the solipsists who discovered sensation without organic matter, thought without brain, nature without objective law! "And the last formulation of causality, which we have not yet mentioned, necessity, or *necessity in nature,* contains something vague and mystical"—(the idea of "fetishism," "anthropomorphism," etc.) (pp. 32, 34). Oh, the poor mystics, Feuerbach, Marx and Engels! They have been talking all the time of necessity in nature, and have even been calling those who hold the Humean position theoretical reactionaries! Petzoldt rises above all "anthropomorphism." He has discovered the great *"law of unique determination,"* which eliminates every obscurity, every trace of "fetishism," etc., etc., etc. For example, the parallelogram of forces (p. 35). This cannot be "proven"; it must be accepted as a "fact of experience." It cannot be conceded that a body under like impulses will move in different ways. "We cannot concede nature such indefiniteness and arbitrariness; we must demand from it definiteness and law" (p. 35). Well, well! We demand of nature obedience to law. The bourgeoisie demands reaction of its professors. "Our thought demands definiteness from nature, and nature always conforms to this demand; we shall even see that in a certain sense it is compelled to conform to it" (p. 36). Why, having received an impulse in the direction of the line AB, does a body move towards C and not towards D or F, etc.?



"Why does nature not choose any of the countless other directions?" (p. 37). Because that would be "multiple determination," and the great empirio-critical discovery of Joseph Petzoldt demands *unique determination.*

The "empirio-criticists" fill scores of pages with such unutterable trash!

"... We have remarked more than once that our thesis does not derive its force from a sum of separate experiences, but that, on the contrary, we demand that nature should recognise its validity *(seine Geltung).* Indeed, even before it becomes a law it has already become for us a principle with which we approach reality, a postulate. It is valid, so to speak, *a priori,* independently of all separate experiences. It would, indeed, be unbefitting for a philosophy of pure experience to preach *a priori* truths and thus relapse into the most sterile metaphysics. Its apriorism can only be a logical one, never a psychological, or metaphysical one" (p. 40). Of course, if we call apriorism logical, then the reactionary nature of the idea disappears and it becomes elevated to the level of "recent positivism"!

There can be no unique determination of psychical phenomena, Petzoldt further teaches us; the role of imagination, the significance of great inventions, etc., here create exceptions, while the law of nature, or the law of spirit, tolerates "no exceptions" (p. 65). We have before us a pure metaphysician, who has not the slightest inkling of the relativity of the difference between the contingent and the necessary.

I may, perhaps, be reminded—continues Petzoldt—of the motivation of historical events or of the development of character in poetry. "If we examine the matter carefully we shall find that there is no such unique determination. There is not a single historical event or a single drama in which we could not imagine the participants acting differently under similar psychical conditions..." (p. 73), "Unique determination is not only absent in the realm of the psychical, but we are also entitled to *demand* its absence from reality [Petzoldt's italics]. Our doctrine is thus elevated to the rank of a *postulate, i.e.,* to the rank of a fact, which we regard as a necessary condition of a much earlier experience, as its *logical a priori*" (Petzoldt's italics, p. 76).

And Petzoldt continues to operate with this "logical *a priori*" in both volumes of his *Einführung,* and in the booklet issued in 1906.[1] Here is a second instance of a noted empirio-criticist who has imperceptibly slipped into Kantianism and who serves up the most reactionary doctrines with a somewhat different sauce. And this is not fortuitous, for at the very foundations of Mach's and Avenarius' teachings on causality there lies an idealist falsehood, which no high-flown talk of "positivism" can cover up. The distinction between the Humean and the Kantian theories of causality is only a secondary difference of opinion between agnostics who are basically at one, *viz.,* in their denial of objective law in nature, and who thus inevitably condemn themselves to idealist conclusions of one kind or another. A rather more "scrupulous" empirio-criticist than J. Petzoldt, Rudolph Willy, who is ashamed of his kinship with the immanentists, rejects, for example, Petzoldt's whole theory of "unique determination" as leading to nothing but "logical formalism." But does Willy improve his position by disavowing Petzoldt? Not in the least, for he disavows Kantian agnosticism solely for the sake of Humean agnosticism. "We have known from the time of Hume," he writes, "that

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[1] J. Petzoldt, *Das Weltproblem von positivistischem Standpunkte aus,* Leipzig 1906, S. 130: "Also from the empirical standpoint there can be a logical *a priori;* causality is the logical *a priori* of the experienced *(erfahrungsmäßige)* permanence of our environment."

'necessity' is a purely logical (not a 'transcendental') characteristic *(Merkmal)*, or, as I would rather say and have already said, a purely verbal *(sprachlich)* characteristic." (R. Willy, *Gegen die Schulweisheit*, München 1905, S. 91; vgl. S. 173, 175.)

The agnostic calls our materialist view of necessity "transcendental," for from the standpoint of Kantian and Humean "school wisdom," which Willy does not reject but only furbishes up, any recognition of objective reality given us in experience is an illicit "transcendence."

Among the French writers of the philosophical trend we are analysing, we find Henri Poincaré constantly straying into this same path of agnosticism. Henri Poincaré is an eminent physicist but a poor philosopher, whose errors Yushkevich, of course, declared to be the last word of recent positivism, so "recent," indeed, that it even required a new "ism," *viz.*, empirio-symbolism. For Poincaré (with whose views as a whole we shall deal in the chapter on the new physics), the laws of nature are symbols, conventions, which man creates for the sake of *"convenience."* "The only true objective reality is the internal harmony of the world." By "objective," Poincaré means that which is generally regarded as valid, that which is accepted by the majority of men, or by all;[1] that is to say, in a purely subjectivist manner he destroys objective truth, as do all the Machians. And as regards "harmony," he categorically declares in answer to the question whether it exists *outside of us*—"undoubtedly, no." It is perfectly obvious that the new terms do not in the least change the ancient philosophical position of agnosticism, for the essence of Poincaré's "original" theory amounts to a denial (although he is far from consistent) of objective reality and of objective law in nature. It is, therefore, perfectly natural that in contradistinction to the Russian Machians, who accept new formulations of old errors as the latest discoveries, the German Kantians greeted such views as a conversion to their own views, *i.e.*, to agnosticism, on a fundamental question of philosophy. "The French mathematician Henri Poincaré," we read in the work of the Kantian, Philipp Frank, "holds the point of view that many of the most general laws of science (*e.g.*, the law of inertia, the law of the conservation of energy, etc.), of which it is so often difficult to say whether they are of empirical or of *a priori* origin, are, in fact, neither one nor the other, but are purely conventional propositions depending upon human discretion...." "Thus [exults the Kantian] the latest *Naturphilosophie* unexpectedly renews the fundamental idea of critical idealism, namely, that experience merely fills in a framework which man brings with him from nature...."[1]

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[1] Henri Poincaré, *La valeur de la science*, Paris 1905, pp. 7, 9.

We quote this example in order to give the reader a clear idea of the degree of naïveté of our Yushkeviches, who take a "theory of symbolism" for something genuinely *new*, whereas philosophers in the least versed in their subject say plainly and explicitly: he has become converted to the standpoint of critical idealism! For the essence of this point of view does not necessarily lie in the repetition of Kant's formulations, but in the recognition of the fundamental idea *common* to both Hume and Kant, *viz.*, the denial of objective law in nature and the deduction of particular "conditions of experience," particular principles, postulates and propositions *from the subject*, from human consciousness, and not from nature. Engels was right when he said that it is not important to which of the numerous schools of materialism or idealism a particular philosopher belongs, but rather whether he takes nature, the external world, matter in motion, or spirit, reason, consciousness, etc., as primary.

Another characterisation of Machism on this question, in contrast to the other philosophical lines, is given by the expert Kantian, E. Lucka. On the question of causality "Mach entirely agrees with Hume."[2] "P. Volkmann derives the necessity of thought from the necessity of the processes of nature—a standpoint that, in contradistinction to Mach and in agreement with Kant, recognises the fact of necessity; but contrary to Kant, it seeks the source of necessity not in thought, but in the processes of nature" (p. 424).

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[1] *Annalen der Naturphilosophie*, Bd. VI, 1907, S. 443, 447.

[2] E. Lucka, *Das Erkenntnisproblem und Machs "Analyse der Empfindungen,"* in *Kantstudien*, Bd. VIII, S. 409.

Volkmann is a physicist who writes fairly extensively on epistemological questions, and who tends, as do the vast majority of scientists, to materialism, albeit an inconsistent, timid, and incoherent materialism. The recognition of necessity in nature and the derivation from it of necessity in thought is materialism. The derivation of necessity, causality, law, etc., from thought is idealism. The only inaccuracy in the passage quoted is that a total denial of all necessity is attributed to Mach. We have already seen that this is not true either of Mach or of the empirio-critical trend generally, which, having definitely departed from materialism, is inevitably sliding into idealism.

It remains for us to say a few words about the Russian Machians in particular. They would like to be Marxists; they have all "read" Engels' decisive demarcation of materialism from the Humean trend; they could not have failed to learn both from Mach himself and from everybody in the least acquainted with his philosophy that Mach and Avenarius follow the line of Hume. Yet they are all careful *not to say a single word* about Humism and materialism on the question of causality! Their confusion is utter. Let us give a few examples. Mr. P. Yushkevich preaches the "new" empirio-symbolism. The "sensations of blue, hard, etc.—these supposed data of pure experience" and "the creations supposedly of pure reason, such as a chimera or a chess game"—all these are "empirio-symbols" (*Studies, etc.,* p. 179). "Knowledge is empirio-symbolic, and as it develops leads to empirio-symbols of a greater degree of symbolisation.... The so-called laws of nature ... are these empirio-symbols..." (p. 179). "The so-called true reality, being 'in itself,' is that infinite [a terribly learned fellow, this Mr. Yushkevich!][1] ultimate system of symbols to which all our knowledge is striving..." (p. 188). "The stream of experience... which lies at the foundation of our knowledge is... irrational... illogical..." (pp. 187, 194). "Energy is just as little a thing, a substance, as time, space, mass and the other fundamental concepts of science: energy is a constancy, an empirio-symbol, like other empirio-symbols that for a time satisfy the fundamental human need of introducing reason, Logos, into the irrational stream of experience" (p. 209).

Clad like a harlequin in a garish motley of shreds of the "latest" terminology, there stands before us a subjective idealist, for whom the external world, nature and its laws are all symbols of our knowledge. The stream of experience is devoid of reason, order and law: our knowledge brings reason into it. The celestial bodies are symbols of human knowledge, and so is the earth. If science teaches us that the earth existed long before it was possible for man and organic matter to have appeared, we, you see, have changed all that! The order of the motion of the planets is brought about *by us,* it is a product of our knowledge. And sensing that human reason is being inflated by such a philosophy into the author and founder of nature, Mr. Yushkevich puts alongside of reason the word *Logos,* that is, reason in the abstract, not reason, but Reason, not a function of the human brain, but something existing prior to any brain, something divine. The last word of "recent positivism" is that old formula of fideism which Feuerbach has already exposed.

Let us take A. Bogdanov. In 1899, when he was still a semi-materialist and had only just begun to go astray under the influence of a very great chemist and very muddled philosopher, Wilhelm Ostwald, he wrote: "The general causal connection of phenomena is the last and best child of human knowledge; it is the universal law, the highest of those laws which, to express it in the words of a philosopher, human reason dictates to nature" (*Fundamental Elements, etc.*, p. 41).

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[1] The exclamation is provoked by the fact that Yushkevich here uses the foreign word *infinite* with a Russian ending.—*Trans.*

Allah alone knows from what source Bogdanov took this reference. But the fact is that "the words of a philosopher" trustingly repeated by the "Marxist"—are the words of *Kant*. An unpleasant event! And all the more unpleasant in that it cannot even be explained by the "mere" influence of Ostwald.

In 1904, having already managed to discard both natural-historical materialism and Ostwald, Bogdanov wrote: "... Modern positivism regards the law of causality only as a means of cognitively connecting phenomena into a continuous series, only as a form of co-ordinating experience" (*From the Psychology of Society*, p. 207). Bogdanov either did not know, or would not admit, that this modern positivism is agnosticism and that it denies the objective necessity of nature, which existed prior to, and outside of, "knowledge" and man. He accepted on faith what the German professors called "modern positivism." Finally, in 1905, having passed through all the previous stages and the stage of empirio-criticism, and being already in the stage of "empirio-monism," Bogdanov wrote: "Laws do not belong to the sphere of experience... they are not given in it, but are created by thought as a means of organising experience, of harmoniously co-ordinating it into a symmetrical whole" (*Empirio-Monism*, I, p. 40). "Laws are abstractions of knowledge; and physical laws possess physical properties just as little as psychological laws possess psychical properties" (*ibid.*).

And so, the law that winter succeeds autumn and the spring winter is not given us in experience but is created by thought as a means of organising, harmonising, co-ordinating .... what with what, Comrade Bogdanov?

"Empirio-monism is possible only because knowledge actively harmonises experience, eliminating its infinite contradictions, creating for it universal organising forms, replacing the primeval chaotic world of elements by a derivative, ordered world of relations" (p. 57). That is not true.

The idea that knowledge can "create" universal forms, replace the primeval chaos by order, etc., is the idea of idealist philosophy. The world is matter moving in conformity to law, and our knowledge, being the highest product of nature, is in a position only to *reflect* this conformity to law.

In brief, our Machians, blindly believing the "recent" reactionary professors, repeat the mistakes of Kantian and Humean agnosticism on the question of causality and fail to notice either that these doctrines are in absolute contradiction to Marxism, *i.e.*, materialism, or that they themselves are rolling down an inclined plane towards idealism.

4. THE "PRINCIPLE OF ECONOMY OF THOUGHT" AND THE PROBLEM OF THE "UNITY OF THE WORLD"

"The principle of 'the least expenditure of energy,' which Mach, Avenarius and many others made the basis of the theory of knowledge, is unquestionably a 'Marxist' tendency in epistemology."

So Bazarov asserts in the *Studies, etc.,* page 69.

There is "economy" in Marx; there is "economy" in Mach. But is it indeed "unquestionable" that there is even a shadow of resemblance between the two?

Avenarius' work, *Philosophie als Denken der Welt gemäß dem Prinzip des kleinsten Kraftmaßes* (1876), as we have seen, applies this "principle" in such a way that in the name of "economy of thought" *sensation alone* is declared to exist. Both causality and "substance" (a word which the professorial gentlemen, "for the sake of importance," prefer to the clearer and more exact word: matter) are declared "eliminated" on the same plea of economy. Thus we get sensation without matter and thought without brain. This utter nonsense is an attempt to smuggle in *subjective idealism* under a new guise. That *such* precisely is the character of this *basic* work on the celebrated "economy of thought" is, as we have seen, *generally acknowledged* in philosophical literature. That our Machians did not notice the subjective idealism under the "new" flag is a fact belonging to the realm of curiosities.

In the *Analyse der Empfindungen* (S. 40), Mach refers incidentally to his work of 1872 on this question. And this work, as we have seen, also propounds the standpoint of *pure* subjectivism and reduces the world to sensations. Thus, both the fundamental works which introduce this famous "principle" into philosophy expound idealism! What is the reason for this? The reason is that if the principle of economy of thought is really made "*the basis* of the theory of knowledge," it can lead to *nothing but* subjective idealism. That it is more "economical" to "think" that only I and my sensations exist is unquestionable, provided we want to introduce such an absurd conception into *epistemology.*

Is it "more economical" to "think" of the atom as indivisible, or as composed of positive and negative electrons? Is it "more economical" to think of the Russian bourgeois revolution as being conducted by the liberals or as being conducted against the liberals? One has only to put the question in order to see the absurdity, the subjectivism of applying the category of "the economy of thought" *here.* Human thought is "economical" only when it *correctly* reflects objective truth, and the criterion of this correctness is practice, experiment and industry. Only by denying objective reality, that is, by denying the *foundations* of Marxism, can one seriously speak of economy of thought in the theory of knowledge.

If we turn to Mach's later works, we shall find in them an *interpretation* of the celebrated principle which frequently amounts to its complete denial. For instance, in the *Wärmelehre* Mach returns to his favourite idea of "the economical nature" of science (2nd German ed., p. 366). But there he adds that we engage in an activity not for the sake of the activity (p. 366; repeated on p. 391): "the purpose of scientific activity is to present the fullest... most tranquil... picture possible of the world" (p. 366). If this is the case, the "principle of economy" is banished not only from the basis of epistemology, but virtually from epistemology generally. When one says that the purpose of science is to present a true picture of the world (tranquillity is entirely beside the point here), one is repeating the materialist point of view. When one says this, one is admitting the objective reality of the world in relation to our knowledge, of the model in relation to the picture. To talk of *economy* of thought in *such* a connection is merely to use a clumsy and pretentious *word* in place of the word "correctness." Mach is muddled here, as usual, and the Machians behold the muddle and worship it!

In *Erkenntnis und Irrtum,* in the chapter entitled "Illustrations of Methods of Investigation," we read the following:

"The 'complete and simplest description' (Kirchhoff, 1874), the 'economical presentation of the factual' (Mach, 1872), the 'concordance of thinking and being and the mutual concordance of the processes of thought' (Grassmann, 1844)—all these, with slight variations, express one and the same thought."

Is this not a model of confusion? "Economy of thought," from which Mach in 1872 inferred that sensations *alone* exist (a point of view which he himself subsequently was obliged to acknowledge an idealist one), is declared to be *equivalent* to the purely materialist dictum of the mathematician Grassmann regarding the necessity of co-ordinating thinking and *being,* equivalent to the simplest *description* (of an *objective reality*, the existence of which it never occurred to Kirchhoff to doubt!).

Such an application of the principle of "economy of thought" is but an example of Mach's curious philosophical waverings. And if such curiosities and lapses are eliminated, the idealist character of "the principle of the economy of thought" becomes unquestionable. For example, the Kantian Hönigswald, controverting the philosophy of Mach, *greets* his "principle of economy" as an *approach* to the "Kantian circle of ideas" (Dr. Richard Hönigswald, *Zur Kritik der Machschen Philosophie;* Berlin 1903, S. 27). And, in truth, if we do not recognise the objective reality given us in our sensations, whence are we to derive the "principle of economy" if not *from the subject?* Sensations, of course, do not contain any "economy." Hence, thought gives us something which is not contained in sensations! Hence, the "principle of economy" is not taken from experience (*i.e.*, sensations), but precedes all experience and, like a Kantian category, constitutes a logical condition of experience. Hönigswald quotes the following passage from the *Analyse der Empfindungen*: "We can . . . from our bodily and spiritual stability infer the stability, the uniqueness of determination and the uniformity of the processes of nature" (p. 288). And, indeed, the subjective-idealist character of such propositions and the kinship of Mach to Petzoldt, who has gone to the length of apriorism, are beyond all shadow of doubt.

In connection with "the principle of the economy of thought," the idealist Wundt very aptly characterised Mach as "Kant turned inside out" (*Systematische Philosophie,* Leipzig 1907, S. 128). Kant has *a priori* and experience, Mach has experience and *a priori,* for Mach's principle of the economy of thought is essentially apriorism (p. 130). The connection *(Verknüpfung)* is either in things, as an "objective law of nature [and this Mach emphatically rejects], or else it is a subjective principle of description" (p. 130). The principle of economy with Mach is subjective and *kommt wie aus der Pistole geschossen*—appears nobody knows whence—as a teleological principle which may have a diversity of meanings (p. 131). As you see, experts in philosophical terminology are not as naïve as our Machians, who are blindly prepared to believe that a "new" term can eliminate the contrast between subjectivism and objectivism, between idealism and materialism.

Finally, let us turn to the English philosopher James Ward, who without circumlocution calls himself a spiritualist monist. He does not controvert Mach, but, as we shall see later, utilises the entire Machian trend in physics in his fight against materialism. And he definitely declares that in Mach "the criterion of simplicity . . . is in the main subjective, not objective" (*Naturalism and Agnosticism,* Vol. I, 3rd ed., p. 82).

That the principle of the economy of thought as the basis of epistemology pleased the German Kantians and English spiritualists will not seem strange after all that has been said above. That people who are desirous of being Marxists should link the political economy of the materialist Marx with the epistemological economy of Mach is simply ludicrous.

It would be appropriate here to say a few words about "the unity of the world." On this question Mr. P. Yushkevich strikingly exemplifies—for the thousandth time perhaps—the abysmal confusion created by our Machians. Engels, in his *Anti-Dühring,* replies to Dühring, who had deduced the unity of the world from the unity of thought, as follows: "The real unity of the world consists in its materiality, and this is proved not by a few juggling phrases, but by a long and protracted development of philosophy and natural science" (p. 53). Mr. Yushkevich cites this passage and retorts: "First of all it is not clear what is meant here by the assertion that 'the unity of the world consists in its materiality' " (*op. cit.,* p. 52).

Charming, is it not? This individual undertakes publicly to prate about the philosophy of Marxism, and then declares that the most elementary propositions of materialism are "not clear" to him! Engels showed, using Dühring as an example, that any philosophy that claims to be consistent can deduce the unity of the world either from thought—in which case it is helpless against spiritualism and fideism (*Anti-Dühring,* p. 53), and its arguments become mere phrase-juggling—or from the objective reality which exists outside us, which in the theory of knowledge has long gone under the name of matter, and which is studied by natural science. It is useless to speak seriously to an individual to whom such a thing is "not clear," for he says it is "not clear" in order fraudulently to evade giving a genuine answer to Engels' clear materialist position. And, doing so, he talks pure Dühringian nonsense about "the cardinal postulate of the fundamental homogeneity and connection of being" (Yushkevich, *op. cit.,* p. 51), about postulates being "propositions" of which "it would not be exact to say that they have been deduced from experience, since scientific experience is possible only because they are made the basis of investigation" *(op. cit).* This is nothing but twaddle, for if this individual had the slightest respect for the printed word he would detect the *idealist* character in general, and the *Kantian* character in particular of the idea that there can be postulates which are not taken from experience and without which experience is impossible. A jumble of words culled from diverse books and coupled with the obvious errors of the materialist Dietzgen—such is the "philosophy" of Mr. Yushkevich and his like.

Let us rather examine the argument for the unity of the world expounded by a serious empirio-criticist, Joseph Petzoldt. Section 29, Vol. II, of his *Einführung* is termed: "The Tendency to a Uniform *(einheitlich)* Conception of the Realm of Knowledge; the Postulate of the Unique Determination of All That Happens." And here are a few samples of his line of reasoning: "...Only in *unity* can one find that natural end beyond which no thought can go and in which, consequently, thought, if it takes into consideration all the facts of the given sphere, can reach quiescence" (p. 79). "... It is beyond doubt that nature does not always respond to the demand for *unity,* but it is equally beyond doubt that in many cases it already satisfies the demand for *quiescence* and it must be held, in accordance with all our previous investigations, that nature in all probability will satisfy this demand in the future in all cases. Hence, it would be more correct to describe the actual soul behaviour as a striving for states of stability rather than as a striving for unity.... The principle of the states of stability goes farther and deeper.... Haeckel's proposal to put the kingdom of the protista alongside the plant and animal kingdom is an untenable solution for it creates two new difficulties in place of the former one difficulty: while formerly the boundary between the plants and animals was doubtful, now it becomes impossible to demarcate the protista from both plants and animals.... Obviously, such a state is not final *(endgültig)*. Such *ambiguity* of concepts must in one way or another be eliminated, if only, should there be no other means, by an agreement between the specialists, or by a majority vote" (pp. 80-81).

Enough, I think? It is evident that the empirio-criticist Petzoldt is *not one whit* better than Dühring. But we must be fair even to an adversary; Petzoldt at least has sufficient scientific integrity to reject materialism as a philosophical trend *unflinchingly and decisively* in all his works. At least, he does not humiliate himself to the extent of posing as a materialist and declaring that the most elementary distinction between the fundamental philosophical trends is "not clear."

5. SPACE AND TIME

Recognising the existence of objective reality, *i.e.*, matter in motion independently of our mind, materialism must also inevitably recognise the objective reality of time and space, in contrast above all to Kantianism, which in this question sides with idealism and regards time and space not as objective realities but as forms of human understanding. The basic difference between the two fundamental philosophical lines on this question is also quite clearly recognised by writers of the most diverse trends who are in any way consistent thinkers. Let us begin with the materialists.

"Space and time," says Feuerbach, "are not mere forms of phenomena but essential conditions *(Wesensbedingungen)... of being"* (*Werke*, II, S. 332). Regarding the sensible world we know through sensations as objective reality, Feuerbach naturally also rejects the phenomenalist (as Mach would call his own conception) or the agnostic (as Engels calls it) conception of space and time. Just as things or bodies are not mere phenomena, not complexes of sensations, but objective realities acting on our senses, so space and time are not mere forms of phenomena, but objectively real forms

of being. There is nothing in the world but matter in motion, and matter in motion cannot move otherwise than in space and time. Human conceptions of space and time are relative, but these relative conceptions go to compound absolute truth. These relative conceptions, in their development, move towards absolute truth and approach nearer and nearer to it. The mutability of human conceptions of space and time no more refutes the objective reality of space and time than the mutability of scientific knowledge of the structure and forms of matter in motion refutes the objective reality of the external world.

Engels, exposing the inconsistent and muddled materialist Dühring, catches him on the very point where he speaks of the change in the *idea* of time (a question beyond controversy for contemporary philosophers of any importance even of the *most diverse* philosophical trends) but *evades* a direct answer to the question: are space and time real or ideal, and are our relative conceptions of space and time *approximations* to objectively real forms of being; or are they only products of the developing, organising and harmonising human mind? This and this alone is the basic epistemological problem on which the truly fundamental philosophical trends are divided. Engels, in *Anti-Dühring,* says: "We are here not in the least concerned as to what ideas change in Herr Dühring's head. The subject at issue is not the *idea* of time, but *real* time, which Herr Dühring cannot rid himself of so cheaply [*i.e.,* by the use of such phrases as the mutability of our conceptions]" (*op. cit.,* p. 62).

This would seem so clear that even the Yushkeviches should be able to grasp the essence of the matter! Engels sets up against Dühring the proposition of *reality* which is generally accepted by and obvious to every materialist, *viz.,* the objective reality of time, and says that *one cannot escape* a direct affirmation or denial of this proposition merely by talking of the change in the *ideas* of space and time. The point is not that Engels denies the necessity and scientific value of investigations into the change and development of our ideas of time and space, but that we should give a consistent answer to the epistemological question, *viz.*, the question of the source and significance of human knowledge in general. Any moderately intelligent philosophical idealist—and Engels when he speaks of idealists has in mind the great consistent idealists of classical philosophy—will readily admit the development of our ideas of time and space; he would not cease to be an idealist for thinking, for example, that our developing ideas of time and space are approaching towards the absolute idea of time and space, and so forth. It is impossible to hold consistently to a standpoint in philosophy which is inimical to all forms of fideism and idealism if we do not definitely and resolutely recognise that our developing notions of time and space *reflect* an objectively real time and space; that here, too, as in general, they are approaching objective truth.

"The basic forms of all being," Engels admonishes Dühring, "are space and time, and existence out of time is just as gross an absurdity as existence out of space" *(op. cit.)*.

Why was it necessary for Engels, in the first half of the quotation, to repeat Feuerbach almost literally and, in the second, to recall the struggle which Feuerbach fought so successfully against the utter absurdities of theism? Because Dühring, as one sees from this same chapter of Engels', could not get the ends of his philosophy to meet without resorting now to the "final cause" of the world, now to the "initial impulse" (which is another expression for the concept "God," Engels says). Dühring no doubt wanted to be a materialist and atheist no less sincerely than our Machians want to be Marxists, but he *was unable* consistently to develop the philosophical point of view that would really cut the ground from under the idealist and theist absurdity. Since he did not recognise, or, at least, did not recognise clearly and distinctly (for he wavered and was muddled on this question), the objective reality of time and space, it was not accidental but inevitable that Dühring should slide down an inclined plane to "final causes" and "initial impulses"; for he had deprived himself of the objective criterion which prevents one going beyond the bounds of time and space. If time and space are *only* concepts, man, who created them, is justified in *going beyond their bounds,* and bourgeois professors are justified in receiving salaries from reactionary governments for defending the right to go beyond these bounds, for directly or indirectly defending mediæval "absurdity."

Engels pointed out to Dühring that the denial of the objective reality of time and space is theoretically philosophical confusion, while practically it is capitulation to, or impotence in face of, fideism.

Behold now the "teachings" of "recent positivism" on this subject. We read in Mach: "Space and time are well-ordered *(wohlgeordnete)* systems of series of sensations" (*Mechanik,* 3. Auflage, S. 498). This is palpable idealist non sense, such as inevitably follows from the doctrine that bodies are complexes of sensations. According to Mach, it is not man with his sensations that exists in space and time, but space and time that exist in man, that depend upon man and are generated by man. He feels that he is falling into idealism, and "resists" by making a host of reservations and, like Dühring, burying the question under lengthy disquisitions (see especially *Erkenntnis und Irrtum*) on the mutability of our conceptions of space and time, their relativity, and so forth. But this does not save him, and cannot save him, for one can really overcome the idealist position on this question only by recognising the objective reality of space and time. And this Mach will not do at any price. He constructs his epistemological theory of time and space on the principle of relativism, and that is all. In the very nature of things such a construction can lead to nothing but subjective idealism, as we have already made clear when speaking of absolute and relative truth.

Resisting the idealist conclusions which inevitably follow from his premises, Mach argues against Kant and insists that our conception of space is derived from experience (*Erkenntnis und Irrtum,* 2. Auflage, S. 350, 385). But if objective reality is *not* given us in experience (as Mach teaches), such an objection to Kant does not in the least destroy the general position of agnosticism in the case either of Kant *or* of Mach. If our conception of space is taken from experience and *is not* a reflection of objective reality outside us, Mach's theory is idealistic. The existence of nature *in time,* measured in millions of years, *prior to* the appearance of man and human experience, shows how absurd this idealist theory is.

"In a physiological respect," writes Mach, "time and space are systems of sensations of orientation which together with sense-perceptions determine the discharge *(Auslösung)* of biologically purposive reactions of adaptation. In a physical respect, time and space are interdependencies of physical elements" (*ibid.,* p. 434).

The relativist Mach confines himself to an examination of the *concept* of time in its various aspects! And like Dühring he gets nowhere. If "elements" are sensations, then the dependence of physical elements upon each other cannot exist outside of man, and could not have existed prior to man and prior to organic matter. If the sensations of time and space can give man a biologically purposive orientation, this can only be so on the condition that these sensations reflect an *objective reality* outside man: man could never have adapted himself biologically to the environment if his sensations had not given him an *objectively correct* presentation of that environment. The theory of space and time is inseparably connected with the answer to the fundamental question of epistemology: are our sensations images of bodies and things, or are bodies complexes of our sensations? Mach merely blunders about between the two answers.

In modern physics, he says, Newton's idea of absolute time and space prevails (pp. 442-44), of time and space as such. This idea seems "to us" senseless, Mach continues—apparently not suspecting the existence of materialists and of a materialist theory of knowledge. But *in practice,* he claims, this view was *harmless* (*unschädlich,* p. 442) and therefore for a long time escaped criticism.

This naïve remark regarding the harmlessness of the materialist view betrays Mach completely. Firstly, it is not true that for a "long time" the idealists did not criticise this view. Mach simply ignores the struggle between the idealist and materialist theories of knowledge on this question; he evades giving a plain and direct statement of these two views. Secondly, by recognising "the harmlessness" of the materialist views he contests, Mach thereby in fact admits their correctness. For if they were incorrect, how could they have remained harmless throughout the course of centuries? What has become of the criterion of practice with which Mach attempted to flirt? The materialist view of the objective reality of time and space can be "harmless" only because natural science *does not transcend* the bounds of time and space, the bounds of the material world, leaving this occupation to the professors of reactionary philosophy. Such "harmlessness" is equivalent to correctness.

It is Mach's idealist view of space and time that is "harmful," for, in the first place, it opens the door wide for fideism and, in the second place, *seduces* Mach himself into drawing reactionary conclusions. For instance, in 1872 Mach wrote that "one does not have to conceive of the chemical elements in a space of three dimensions" (*Erhaltung der Arbeit*, S. 29, repeated on p. 55). To do so would show us "what an unnecessary restriction we impose upon ourselves. There is no more necessity to think of what is mere thought *(das bloß Gedachte)* spatially, that is to say, in relation to the visible and tangible, than there is to think of it in a definite pitch" (p. 27). "The reason why a satisfactory theory of electricity has not yet been established is perhaps because we have insisted on explaining electrical phenomena in terms of molecular processes in a three-dimensional space" (p. 30).

From the standpoint of the straightforward and unmuddled Machism which Mach openly advocated in 1872, it is indisputable that if molecules, atoms, in a word, chemical elements, cannot be perceived, they are "mere thought" *(das bloß Gedachte)*. If so, and if space and time have no objective reality, it is obvious that it is not essential to think of atoms *spatially!* Let physics and chemistry "restrict themselves" to a three-dimensional space in which matter moves; for the explanation of electricity, however, we may seek its elements in a space which is *not* three-dimensional!

That our Machians should circumspectly avoid all reference to this absurdity of Mach's, although he repeats it in 1906 (*Erkenntnis und Irrtum*, 2 Auflage, S. 418), is understandable, for otherwise they would have to raise the question of the idealist and materialist views of space point-blank, without evasions and without attempting to "reconcile" these antagonistic positions. It is likewise understandable that in the 'seventies, when Mach was still entirely unknown and when even "orthodox physicists" refused to publish his articles, one of the chiefs of the immanentist school, Anton von Leclair, should *eagerly* have seized upon *precisely this* argument of Mach's as a noteworthy renunciation of materialism and a recognition of idealism! For at that time Leclair had not yet invented, or had not yet borrowed from Schuppe and Schubert-Soldern, or J. Rehmke, the "new" sobriquet, "immanentist school," but *plainly* called himself a *critical idealist*.[1] This unequivocal advocate of fideism, who openly preached it in his philosophical works, immediately proclaimed Mach a great philosopher because of these statements, a "revolutionary in the best sense of the word" (p. 252); and he was absolutely right. Mach's argument amounts to deserting science for fideism. Science was seeking, both in 1872 and in 1906, is now seeking, and is discovering—at least *it is groping its way towards*—the atom of electricity, the electron, in three-dimensional space. Science does not doubt that the substance it is investigating exists in three-dimensional space and, hence, that the particles of that substance, although they be so small that we cannot see them, must also "necessarily" exist in this three-dimensional space. Since 1872, during the course of three decades of stupendous and dazzling scientific successes in the problem of the structure of matter, the materialist view of space and time has remained "harmless," *i.e.*, compatible, as heretofore, with science, while the contrary view of Mach and Co. was a "harmful" capitulation to the position of fideism.

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[1] Anton von Leclair, *Der Realismus der modernen Naturwissenschaft im Lichte der von Berkeley und Kant angebahnten Erkenntniskritik*, Prag 1879.

In his *Mechanik*, Mach defends the mathematicians who are investigating the problem of conceivable spaces with *n* dimensions; he defends them against the charge of drawing "preposterous" conclusions from their investigations. The defence is absolutely and undoubtedly just, but see the *epistemological* position Mach takes up in this defence. Recent mathematics, Mach says, has raised the very important and useful question of a space of *n* dimensions as a conceivable space; nevertheless, three-dimensional space remains the only "real case" *(Ein wirklicher Fall)* (3rd German ed., pp. 483-85). In vain, therefore, "have many theologians, who experience difficulty in deciding where to place hell," as well as the spiritualists, sought to derive advantage from the fourth dimension *(ibid.)*.

Very good! Mach refuses to join company with the theologians and the spiritualists. But how does he dissociate himself from them in his *theory of knowledge*? By stating that three-dimensional space alone is *real*! But what sort of defence is it against the theologians and their like when you deny objective reality to space and time? Why, it comes to this, that when you have to dissociate yourself from the spiritualists you resort to tacit borrowings from the materialists. For the materialists, by recognising the real world, the matter we perceive, as an *objective* reality, have the right to conclude therefrom that no human concept, whatever its purpose, is valid if it goes beyond the bounds of time and space. But you Machian gentlemen deny the objective validity of "reality" when you combat materialism, yet secretly introduce it again when you have to combat an idealism that is consistent, fearless and frank throughout. If in the *relative* conception of time and space there is nothing but relativity, if there is no objective reality (*i.e.*, reality independent of man and mankind) reflected by these relative concepts, why should mankind, why should the majority of mankind, not be entitled to conceive of beings outside time and space? If Mach is entitled to seek atoms of electricity, or atoms in general, *outside* three-dimensional space, why should the majority of mankind not be entitled to seek the atoms, or the foundations of morals, *outside* three-dimensional space?

"There has never been an accoucheur who has helped a delivery by means of the fourth dimension," Mach goes on to say.

An excellent argument—but only for those who regard the criterion of practice as a confirmation of the *objective* truth and *objective* reality of our perceptual world. If our sensations give us an objectively true image of the external world, existing independently of us, the argument based on the accoucheur, on human practice generally, is valid. But if so, Machism as a philosophical trend is not valid.

"I hope, however," Mach continues, referring to his work of 1872, "that nobody will defend ghost-stories *(die Kosten einer Spukgeschichte bestreiten)* with the help of what I have said and written on this subject."

One cannot hope that Napoleon did not die on May 5, 1821. One cannot hope that Machism will not be used in the service of "ghost-stories" when it has already served and continues to serve the immanentists!

And not only the immanentists, as we shall see later. Philosophical idealism is nothing but a disguised and embellished ghost-story. Look at the French and English representatives of empirio-criticism, who are less flowery than the German representatives of this philosophical trend. Poincaré says that the concepts space and time are relative and that it follows (for non-materialists "it follows" indeed) that "nature does not impose them upon us, but we impose them upon nature, for we find them convenient" (*op. cit.*, p. 6). Does this not justify the exultation of the German Kantians? Does this not confirm Engels' statement that consistent philosophical doctrines must take either nature or human thought as primary?

The views of the English Machist Karl Pearson are quite definite. He says: "Of time as of space we cannot assert a real existence: it is not in things but in our mode of perceiving them" (*op. cit.,* p. 184). This is idealism, pure and simple. "Like space, it [time] appears to us as one of the plans on which that great sorting-machine, the human perceptive faculty, arranges its material" *(ibid.).* Pearson's final conclusion, expounded as usual in clear and precise theses, is as follows: "Space and time are not realities of the phenomenal world, but the modes under which we perceive things apart. They are not infinitely large nor infinitely divisible, but are essentially limited by the contents of our perception" (p. 191, summary of Chapter V on Space and Time).

This conscientious and scrupulous foe of materialism, with whom, we repeat, Mach frequently expresses his complete agreement and who in his turn explicitly expresses his agreement with Mach, invents no special signboard for his philosophy, and without the least ambiguity names Hume and Kant as the classics from whom he derives his philosophical trend! (p. 192).

And while in Russia there are naïve people who believe that Machism has provided a "new" solution of the problem of space and time, in English writings we find that scientists, on the one hand, and idealist philosophers, on the other, at once took up a definite position in regard to Karl Pearson. Here, for example, is the opinion of Lloyd Morgan, the biologist: "Physics as such accepts the phenomenal world as external to, and for its purposes independent of, the mind of the investigator.... He [Professor Pearson] is forced to a position which is largely idealistic...."[1] "Physics, as a science, is wise, I take it, in dealing with space and time in frankly objective terms, and I think the biologist may still discuss the distribution of organisms in space and the geologist their distribution in time, without pausing to remind their readers that after all they are only dealing with sense-impressions and stored sense-impressions and certain forms of perception.... All this may be true enough, but it is out of place either in physics or biology" (p. 304). Lloyd Morgan is a representative of the kind of agnosticism that Engels calls "shamefaced materialism," and however "conciliatory" the tendencies of such a philosophy are, nevertheless it proved impossible to reconcile Pearson's views with science. With Pearson "the mind is first in space, and then space in it," says another critic.[1] "There can be no doubt," remarked a defender of Pearson, R. J. Ryle, "that the doctrine as to the nature of space and time which is associated with the name of Kant is the most important positive addition which has been made to the idealistic theory of human knowledge since the days of Bishop Berkeley; and it is one of the noteworthy features of the *Grammar of Science* that here, perhaps for the first time in the writings of English men of science, we find at once a full recognition of the general truth of Kant's doctrine, a short but clear exposition of it...."[2]

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[1] *Natural Science,* Vol. I, 1892, p. 300.

Thus we find that in England the Machians themselves, their adversaries among the scientists, and their adherents among the professional philosophers *do not* entertain even *a shadow of doubt* as to the idealistic character of Mach's doctrine of time and space. Only a few Russian writers, would-be Marxists, failed "to notice" it.

"Many of Engels' particular views," V. Bazarov, for instance, writes, in the *Studies* (p. 67), "as for example, his conception of 'pure' time and space, are now obsolete."

Yes, indeed! The views of the materialist Engels are now obsolete, but the views of the idealist Pearson and the muddled idealist Mach are very modern! The most curious thing of all is that Bazarov does not even doubt that the views of space and time, *viz.*, the recognition or denial of their objective reality, can be classed among *"particular views,"* in contradistinction to the *"starting point of the world outlook"* spoken of by this author in his next sentence.

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[1] J. M. Bentley, *The Philosophical Review*, Vol. VI, 1897, p. 523.

[2] R. J. Ryle, *Natural Science*, August 1892, p. 454.

Here is an example of that "eclectic pauper's broth" of which Engels was wont to speak in reference to German philosophy of the 'eighties. For to contrast the "starting point" of Marx's and Engels' materialist world outlook with their "particular view" of the objective reality of time and space is as utterly nonsensical as though you were to contrast the "starting point" of Marx's economic theory with his "particular view" of surplus value. To sever Engels' doctrine of the objective reality of time and space from his doctrine of the transformation of "things-in-themselves" into "things-for-us," from his recognition of objective and absolute truth, *viz.*, the objective reality given us in our sensations, and from his recognition of objective law, causality and necessity in nature—is to reduce an integral philosophy to an utter jumble. Like all the Machians, Bazarov erred in confounding the mutability of human conceptions of time and space, their exclusively relative character, with the immutability of the fact that man and nature exist only in time and space, and that beings outside time and space, as invented by the priests and maintained by the imagination of the ignorant and downtrodden mass of humanity, are disordered fantasies, the artifices of philosophical idealism—useless products of a useless social system. The teachings of science on the structure of matter, on the chemical composition of food, on the atom and the electron, may and do become obsolete, but the truth that man is unable to subsist on ideas and to beget children by platonic love alone never becomes obsolete. And a philosophy that denies the objective reality of time and space is as absurd, as intrinsically rotten and false as is the denial of these latter truths. The artifices of the idealists and the agnostics are on the whole as hypocritical as the sermons on platonic love of the pharisees!

In order to illustrate this distinction between the relativity of our concepts of time and space and the *absolute* opposition, within the bounds of epistemology, between the materialist and idealist lines on this question, I shall further quote a characteristic passage from a very old and very pure "empirio-criticist," namely, the Humean Schulze-Aenesidemus who wrote in 1792:

"If we infer 'things outside us' from ideas and thoughts within us, [then] space and time are something real and actually existing outside us, for the existence of bodies can be conceived only in an existing *(vorhandenen)* space, and the existence of changes only in an existing time" (*op. cit.*, p. 100).

Exactly! While firmly rejecting materialism, and even the slightest concession to materialism, Schulze, the follower of Hume, described in 1792 the relation between the question of space and time and the question of an objective reality outside us just as the materialist Engels described it in 1894 (the last preface to *Anti-Dühring* is dated May 23, 1894). This does not mean that during these hundred years our ideas of time and space have undergone no change, or that a vast amount of new material has not been gathered on the *development* of these ideas (material to which both Voroshilov-Chernov and Voroshilov-Valentinov refer as supposedly refuting Engels). This does mean that the *relation between* materialism and agnosticism, as fundamental trends in philosophy, could not have changed, in spite of all the "new" names paraded by our Machians.

And Bogdanov too contributes absolutely nothing but "new" names to the old philosophy of idealism and agnosticism. When he repeats the arguments of Hering and Mach on the difference between physiological and geometrical space, or between perceptual and abstract space (*Empirio-Monism,* Bk. I, p. 26), he is fully repeating the mistake of Dühring. It is one thing, how, with the help of various sense-organs, man perceives space, and how, in the course of a long historical development, abstract ideas of space are derived from these perceptions; it is an entirely different thing whether there is an objective reality independent of mankind which corresponds to these perceptions and conceptions of mankind. This latter question, although it is the only philosophical question, Bogdanov "did not notice" beneath the mass of detailed investigations on the former question, and he was therefore unable clearly to distinguish between Engels' materialism and Mach's confusion.

Time, like space, is "a form of social-co-ordination of the experiences of different people," their "objectivity" lies in their "general significance" (*ibid.,* p. 34).

This is absolutely false. Religion also has general significance as expressing the social co-ordination of the experience of the larger section of humanity. But there is no objective reality that corresponds to the teachings of religion, for example, on the past of the earth and the creation of the world. There *is* an objective reality that *corresponds* to the teaching of science (although it is as relative at every stage in the development of science as every stage in the development of religion is relative) that the earth existed *prior to* any society, *prior to* man, *prior to* organic matter, and that it has existed for a *definite* time and in a *definite* space in relation to the other planets. According to Bogdanov, various forms of space and time adapt themselves to man's experience and his perceptive faculty. As a matter of fact, just the reverse is true: our "experience" and our perceptions adapt themselves more and more to *objective* space and time, and *reflect* them ever more correctly and profoundly.

6. FREEDOM AND NECESSITY

On pages 140-41 of the *Studies,* A. Lunacharsky quotes the argument given by Engels in *Anti-Dühring* on this question and fully endorses the "remarkably precise and apt" statement of the problem made by Engels in that "wonderful page" of the work mentioned.[1]

There is, indeed, much that is wonderful here. And even more "wonderful" is the fact that neither Lunacharsky, nor the whole crowd of other Machian would-be Marxists, "noticed" the epistemological significance of Engels' discussion of freedom and necessity. They read it and they copied it, but they did not make head or tail of it.

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[1] Lunacharsky says: "... a wonderful page of religious economics. I say this at the risk of provoking a smile from the irreligious reader." However good your intentions may be, Comrade Lunacharsky, your flirtation with religion provokes not smiles, but disgust.

Engels says: "Hegel was the first to state correctly the relation between freedom and necessity. To him, freedom is the appreciation of necessity. 'Necessity is *blind* only *in so far as it is not understood.*' Freedom does not consist in the dream of independence of natural laws, but in the knowledge of these laws, and in the possibility this gives of systematically making them work towards definite ends. This holds good in relation both to the laws of external nature and to those which govern the bodily and mental existence of men themselves—two classes of laws which we can separate from each other at most only in thought but not in reality. Freedom of the will therefore means nothing but the capacity to make decisions with real knowledge of the subject. Therefore the *freer* a man's judgment is in relation to a definite question, with so much the greater *necessity* is the content of this judgment determined.... Freedom therefore consists in the control over ourselves and over external nature which is founded on knowledge of natural necessity."[1]

Let us examine the epistemological premises upon which this argument is based.

Firstly, Engels at the very outset of his argument recognises laws of nature, laws of external nature, the necessity of nature—*i.e.,* all that Mach, Avenarius, Petzoldt and Co. characterise as "metaphysics." If Lunacharsky had really wanted to reflect on Engels' "wonderful" argument he could not have helped noticing the fundamental difference between the materialist theory of knowledge and agnosticism and idealism, which deny law in nature or declare it to be only "logical," etc., etc.

Secondly, Engels does not attempt to contrive "definitions" of freedom and necessity, the kind of scholastic definition with which the reactionary professors (like Avenarius) and their disciples (like Bogdanov) are most concerned. Engels takes the knowledge and will of man, on the one hand, and the necessity of nature, on the other, and instead of giving definitions, simply says that the necessity of nature is primary, and human will and mind secondary. The latter must necessarily and inevitably adapt themselves to the former. Engels regards this as so obvious that he does not waste words explaining his view. It needs the Russian Machians to *complain* of *Engels'* general definition of materialism (that nature is primary and mind secondary; remember Bogdanov's "perplexity" on this point!), and at the same time to regard *one of the particular applications* by Engels of this general and fundamental definition as "wonderful" and "remarkably apt"!

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[1] *Anti-Dühring,* p. 128.—*Trans.*

Thirdly, Engels does not doubt the existence of "blind necessity." He admits the existence of a necessity *unknown* to man. This is quite obvious from the passage just quoted. But how, from the standpoint of the Machians, can man *know* of the existence of what he *does not know*? Is it not "mysticism," "metaphysics," the admission of "fetishes" and "idols," is it not the "Kantian unknowable thing-in-itself" to say that we know of the existence of an unknown necessity? Had the Machians given the matter any thought they could not have failed to observe the *complete identity* between Engels' argument on the knowability of the objective nature of things and on the transformation of "things-in-themselves" into "things-for-us," on the one hand, and his argument on a blind, unknown necessity, on the other. The development of consciousness in each human individual and the development of the collective knowledge of humanity at large presents us at every step with examples of the transformation of the unknown "thing-in-itself" into the known "thing-for-us," of the transformation of blind, unknown necessity, "necessity-in-itself," into the known "necessity-for-us." Epistemologically, there is no difference whatever between these two transformations, for the basic point of view in both cases is the same, *viz.*, materialistic, the recognition of the objective reality of the external world and of the laws of external nature, and of the fact that this world and these laws are fully knowable to man but can never be known to him *with finality.* We do not know the necessity of nature in the phenomena of the weather, and to that extent we are inevitably slaves of the weather. But while we *do not know* this necessity, *we do know* that it exists. Whence this knowledge? From the very source whence comes the knowledge that things exist outside our mind and independently of it, namely, from the development of our knowledge, which provides millions of examples to every individual of knowledge replacing ignorance when an object acts upon our sense-organs, and conversely of ignorance replacing knowledge when the possibility of such action is eliminated.

Fourthly, in the above-mentioned argument Engels plainly employs the *salto vitale* method in philosophy, that is to say, he makes a *leap* from theory to practice. Not a single one of the learned (and stupid) professors of philosophy, in whose footsteps our Machians follow, would permit himself to make such a leap, for this would be a disgraceful thing for a devotee of "pure science" to do. For them the theory of knowledge, which demands the cunning concoction of definitions, is one thing, while practice is another. For Engels all living human practice permeates the theory of knowledge itself and provides an *objective* criterion of truth. For until we know a law of nature, it, existing and acting independently and outside our mind, makes us slaves of "blind necessity." But once we come to know this law, which acts (as Marx pointed out a thousand times) *independently* of our will and our mind, we become the lords of nature. The mastery of nature manifested in human practice is a result of an objectively correct reflection within the human head of the phenomena and processes of nature, and is proof of the fact that this reflection (within the limits of what is revealed by practice) is objective, absolute, and eternal truth.

What is the result? Every step in Engels' argument, literally almost every phrase, every proposition, is constructed entirely and exclusively upon the epistemology of dialectical materialism, upon premises which stand out in striking contrast to the Machian nonsense about bodies being complexes of sensations, of "elements," of "the coincidence of sense-perceptions with the reality that exists outside us," etc., etc., etc. Without being the least deterred by this, the Machians abandon materialism and repeat (à la Berman) the vulgar banalities about dialectics, and at the same time welcome with open arms *one* of the applications of dialectical materialism. They have taken their philosophy from an eclectic pauper's broth and are continuing to offer this hotchpotch to the reader. They take a bit of agnosticism and a morsel of idealism from Mach, add to it slices of dialectical materialism from Marx, and call this mixture a *development* of Marxism. They imagine that if Mach, Avenarius, Petzoldt, and all the authorities of theirs have not the slightest inkling of how Hegel and Marx solved the problem (of freedom and necessity), this is purely accidental: why, it was simply because they overlooked a certain page in a certain book, and not because these "authorities" were and are utter ignoramuses on the subject of the *real* progress made by philosophy in the nineteenth century and because they were and are philosophical obscurantists.

Here is the argument of one such obscurantist, the philosophy professor-in-ordinary at the University of Vienna, Ernst Mach:

"The correctness of the position of 'determinism' or 'indeterminism' cannot be demonstrated. Only a perfect science or a provedly impossible science could decide this question. It is a matter of the presuppositions which we bring *(man heranbringt)* to the consideration of things, depending upon whether we ascribe to previous successes or failures of the investigation a greater or lesser subjective weight *(subjektives Gewicht)*. But during the investigation every thinker is of necessity a theoretical determinist" (*Erkenntnis und Irrtum*, 2. Aufl., S. 282 u. 283).

Is this not obscurantism, when pure theory is carefully partitioned off from practice; when determinism is confined to the field of "investigation," while in the field of morality, social activity, and all fields other than "investigation" the question is left to a "subjective" estimate? In my workroom, says the learned pedant, I am a determinist; but that the philosopher should seek to obtain an integral conception of the world based on determinism, embracing both theory and practice—of that there is no mention. Mach utters banalities because on the theoretical problem of freedom and necessity he is entirely at sea.

"...Every new discovery discloses the defects of our knowledge, reveals a residue of dependencies hitherto unheeded..." (p. 283). Excellent! And is this "residue" the "thing-in-itself," which our knowledge reflects ever more deeply? Not at all: "...Thus, he also who in theory defends extreme determinism, must nevertheless in practice remain an indeterminist..." (p. 283). And so things have been amicably divided:[1] theory for the professors, practice for the theologians! Or, objectivism (*i.e.*, "shamefaced" materialism) in theory and the "subjective method in sociology" in practice. No wonder the Russian ideologists of philistinism, the Narodniks, from Lessevich to Chernov, sympathise with this banal philosophy. But it is very sad that would-be Marxists have been captivated by such nonsense and are embarrassedly covering up the more absurd of Mach's conclusions.

But on the question of the will Mach is not content with confusion and half-hearted agnosticism: he goes much further. "...Our sensation of hunger," we read in the *Mechanik*, "is not so essentially different from the affinity of sulphuric acid for zinc, and our will is not so very different from the pressure of the stone on its support.... We shall thus find ourselves [that is, if we hold such a view] nearer to nature without it being necessary to resolve ourselves into an incomprehensible nebula of molecules, or to resolve nature into a system of phantoms" (French translation, p. 434). Thus there is no need for materialism ("nebulous atoms" or electrons, *i.e.*, the recognition of the objective reality of the material world), there is no need for an idealism which would recognise the world as "the otherness" of spirit; but there is a possible idealism which recognises the world as *will*! We are superior not only to materialism, but also to the idealism of a Hegel; but we are not averse to coquetting with an idealism like Schopenhauer's! Our Machians, who assume an air of injured innocence at every reminder of Mach's kinship to philosophical idealism, preferred to keep silent on this delicate question too. Yet it is difficult to find in philosophical writings an exposition of Mach's views which does not mention his tendency towards *Willensmetaphysik, i.e.,* voluntaristic idealism. This was pointed out by J. Baumann,[1] and in replying to him the Machian Kleinpeter does not take exception to this point, but declares that Mach is, of course, "nearer to Kant and Berkeley than to the metaphysical empiricism prevailing in science" (*i.e.,* instinctive materialism; *ibid.*, Vol. VI, p. 87). This is also pointed out by E. Becher, who remarks that if Mach in some places advocates voluntaristic metaphysics, and in others renounces it, it only testifies to the arbitrariness of his terminology; in fact, Mach's kinship to voluntarist metaphysics is beyond doubt.[2] Even Lucka admits the admixture of this metaphysics (*i.e.*, idealism) to "phenomenalism" (*i.e.,* agnosticism).[3] Wundt also points this out.[4] That Mach is a phenomenalist who is "not averse to voluntaristic idealism" is attested also in Ueberweg-Heinze's textbook on the history of modern philosophy.[5]

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[1] Mach in the *Mechanik* says: "Religious opinions are people's *strictly private affairs* as long as they do not obtrude them on others and do not apply them to things which belong to another sphere" (p. 456).

In short, Mach's eclecticism and his tendency to idealism are clear to everyone except perhaps the Russian Machians.

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[1] *Archiv für systematische Philosophie*, 1898, Bd. IV, S. 63, article on Ernst Mach's philosophical views.

[2] Erich Becher, "The Philosophical Views of Ernst Mach," in the *Philosophical Review*, Vol. XIV, 5, 1905, pp. 536, 546, 547, 548.

[3] E. Lucka, *"Das Erkenntnisproblem und Machs Analyse der Empfindungen," Kantstudien*, Bd. VIII, 1903, S. 400.

[4] *Systematische Philosophie*, Leipzig 1907, S. 131.

[5] *Grundriß der Geschichte der Philosophie*, 9. Aufl., Berlin 1903, Bd. IV, S. 250.

CHAPTER FOUR

THE PHILOSOPHICAL IDEALISTS AS COMRADES-IN-ARMS AND SUCCESSORS OF EMPIRIO-CRITICISM

So far we have examined empirio-criticism taken by itself. We must now examine it in its historical development and in its connection and relation with other philosophical trends. First comes the question of the relation of Mach and Avenarius to Kant.

1. THE CRITICISM OF KANTIANISM FROM THE LEFT AND FROM THE RIGHT

Both Mach and Avenarius began their philosophical careers in the 'seventies, when the fashionable cry in German professorial circles was "Back to Kant." And, indeed, both founders of empirio-criticism in their philosophical development started from Kant. "His (Kant's) critical idealism," says Mach, "was, as I acknowledge with the deepest gratitude, the starting point of all my critical thought. But I found it impossible to remain faithful to it. Very soon I began to return to the views of Berkeley ... [and then] arrived at views akin to those of Hume.... And even today I cannot help regarding Berkeley and Hume as far more consistent thinkers than Kant" (*Analyse der Empfindungen,* S. 299).

Thus Mach quite definitely admits that having begun with Kant he soon adopted the position of Berkeley and Hume. Let us turn to Avenarius.

In his *Prolegomena zu einer Kritik der reinen Erfahrung* (1876), Avenarius states that the words *Kritik der reinen Erfahrung (Critique of Pure Experience)* are indicative of his attitude towards Kant's *"Critique of Pure Reason,"* and "of course, of an antagonistic attitude" towards Kant (p. iv). In what does Avenarius' antagonism to Kant consist? In the fact that Kant, in Avenarius' opinion, had not sufficiently "purified experience." It is with this "purification of experience" that Avenarius deals in his *Prolegomena* (§§ 56, 72 and many other places). Of what does Avenarius "purify" the Kantian doctrine of experience? In the first place, of apriorism. In § 56 he says: "The question as to whether the superfluous '*a priori* conceptions of reason' should and could be eliminated from the content of experience and thereby *pure experience par excellence* established, is, as far as I know, raised here, as such, for the first time." We have already seen that Avenarius in this way "purified" Kantianism of the recognition of necessity and causality.

Secondly, he purifies Kantianism of the assumption of substance (§ 95), *i.e.*, the thing-in-itself, which, in Avenarius' opinion "is not given in the stuff of actual experience but is imported into it by thought."

We shall presently see that Avenarius' definition of his philosophical line entirely coincides with that of Mach, differing only in pompousness of formulation. But we must first note that Avenarius is telling a *plain untruth* when he asserts that it was he who in 1876 *for the first time* raised the question of "purifying experience," *i.e.*, of purifying the Kantian doctrine of apriorism and the assumption of the thing-in-itself. As a matter of fact, the development of German classical philosophy immediately after Kant gave rise to a criticism of Kantianism exactly *along the very line* followed by Avenarius. This line is represented in German classical philosophy by Schulze-Aenesidemus, an adherent of Humean agnosticism, and by J. G. Fichte, an adherent of Berkeleianism, *i.e.*, of subjective idealism. In 1792 Schulze-Aenesidemus criticised Kant for *this very* recognition of apriorism (*op. cit.*, pp. 56, 141, etc.) and of the thing-in-itself. We sceptics, or followers of Hume, says Schulze, reject the thing-in-itself as being "beyond the bounds of all experience" (p. 57). We reject *objective knowledge* (p. 25); we deny that space and time really exist outside us (p. 100):

we reject the presence in our experience of necessity (p. 112), causality, force, etc. (p. 113). One cannot attribute to them any "reality outside our conceptions" (p. 114). Kant proves apriority "dogmatically," saying that since we cannot think otherwise there is therefore an *a priori* law of thought. "This argument," Schulze replies to Kant, "has long been utilised in philosophy to prove the objective nature of what lies outside our ideas" (p. 141). Arguing thus, we may attribute causality to things-in-themselves (p. 142). "Experience never tells us *(wir erfahren niemals)* that the action on us of objective things produces ideas," and Kant by no means proved that "this something (which lies outside our reason) must be regarded as a thing-in-itself, distinct from our sensation *(Gemüt)*. But sensation also may be thought of as the *sole* basis of all our knowledge" (p. 265). The Kantian critique of pure reason "bases its argument on the proposition that every act of cognition begins with the action of objective things on our organs of sensation *(Gemüt)*, but it then disputes the truth and reality of this proposition" (p. 266). Kant in no way refuted the idealist Berkeley (pp. 268-72).

It is evident from this that the Humean Schulze rejects Kant's doctrine of the thing-in-itself as an inconsistent concession to materialism, *i.e.*, to the "dogmatic" assertion that in our sensations we are given objective reality, or, in other words, that our ideas are caused by the action of objective things (independent of our ideas) on our sense-organs. The agnostic Schulze reproaches the agnostic Kant on the grounds that the latter's assumption of the thing-in-itself contradicts agnosticism and leads to materialism. In the same way, but even more vigorously, Kant is criticised by the subjective idealist Fichte, who maintains that Kant's assumption of the thing-in-itself independent of the self is *"realism"* (*Werke*, I. S. 483), and that Kant makes "no clear" distinction between "realism" and "idealism." Fichte sees a crying inconsistency in the assumption of Kant and the Kantians that the thing-in-itself is the "basis of objective reality" (p. 480), for this is in contradiction to critical idealism. "With you," exclaims Fichte, addressing the realist expositors of Kant, "the earth rests on the great elephant, and the great elephant rests on the earth. Your thing-in-itself, which is only thought, acts on the Self!" (p. 483).

Thus Avenarius was profoundly mistaken in imagining that he "for the first time" undertook a "purification of the experience" of Kant from apriorism and from the thing-in-itself and that he was thereby giving rise to a "new" trend in philosophy. In reality he was continuing the *old* line of Hume and Berkeley, Schulze-Aenesidemus and J. G. Fichte. Avenarius imagined that he was "purifying experience" in general. In reality he was only *purifying agnosticism of Kantianism.* He fought not against the agnosticism of Kant (agnosticism is a denial of objective reality given in sensation), but for a *purer agnosticism,* for the elimination of Kant's assumption, which is contradictory to agnosticism, that there is a thing-in-itself, albeit unknowable, noumenal and other-sided, that there is necessity and causality, albeit *a priori,* given in our understanding, and not in objective reality. He fought Kant not from the *Left,* as the materialists fought Kant, but from the *Right,* as the sceptics and idealists fought Kant. He imagined that he was advancing, when in reality he was retreating to the programme of criticising Kant which Kuno Fischer, speaking of Schulze-Aenesidemus, aptly characterised in the following words: "The critique of pure reason with pure reason [*i.e.,* apriorism] left out is scepticism.... The critique of pure reason with the thing-in-itself left out is Berkeleian idealism" (*Geschichte der neueren Philosophie,* 1869, Bd. V, S. 115).

This brings us to one of the most curious episodes in our whole "Machiad," in the whole campaign of the Russian Machians against Engels and Marx. The latest discovery by Bogdanov and Bazarov, Yushkevich and Valentinov, trumpeted by them in a thousand different keys, is that Plekhanov is making a "luckless attempt to reconcile Engels with Kant by the aid of a compromise—a thing-in-itself which is just a wee bit knowable" (*Studies,* etc., p. 67 and many other places). This discovery of our Machians discloses a veritably bottomless pit of utter confusion and monstrous misunderstanding both of Kant and of the whole course of development of German classical philosophy.

The principal feature of Kant's philosophy is the reconciliation of materialism with idealism, a compromise between the two, the combination within one system of heterogeneous and contrary philosophical trends. When Kant assumes that something outside us, a thing-in-itself, corresponds to our ideas, he is a materialist. When he declares this thing-in-itself to be unknowable, transcendental, other-sided, he is an idealist. Recognising experience, sensations, as the only source of our knowledge, Kant is directing his philosophy towards sensationalism, and *via* sensationalism, under certain conditions, towards materialism. Recognising the apriority of space, time, causality, etc., Kant is directing his philosophy towards idealism. Both consistent materialists and consistent idealists (as well as the "pure" agnostics, the Humeans) have mercilessly criticised Kant for this inconsistency. The materialists blamed Kant for his idealism, rejected the idealist features of his system, demonstrated the knowability, the this-sidedness of the thing-in-itself, the absence of a fundamental difference between the thing-in-itself and the phenomenon, the need of deducing causality, etc., not from the *a priori* laws of thought, but from objective reality. The agnostics and idealists blamed Kant for his assumption of the thing-in-itself as a concession to materialism, "realism" or "naïve realism." The agnostics, moreover, rejected not only the thing-in-itself, but apriorism as well; while the idealists demanded the consistent deduction from pure thought not only of the *a priori* forms of the understanding, but of the world as a whole (by magnifying human thought to an abstract *Self*, or to an "absolute Idea," or to a "universal *Will*," etc). And here our Machians, "without noticing" that they had taken as their teachers men who had criticised Kant from the standpoint of scepticism and idealism, began to rend their clothes and to cover their heads with ashes at the sight of monstrous people who criticised Kant from a *diametrically opposite point of view*, who rejected the slightest element of agnosticism (scepticism) and idealism in his system, who argued that the thing-in-itself is objectively real, fully knowable and this-sided, that it does not differ fundamentally from appearance, that it becomes transformed into appearance at every step in the development of the individual consciousness of man and the collective consciousness of mankind. Help, they cried, this is an illegitimate mixture of materialism and Kantianism!

When I read the assurances of our Machians that they criticise Kant far more consistently and thoroughly than any of the antiquated materialists, it always seems to me as though Purishkevich[1] had joined our company and was shouting: I criticised the Constitutional-Democrats far more consistently and thoroughly than you Marxist gentlemen! There is no question about it, Mr. Purishkevich, politically consistent people can and always will criticise the Constitutional-Democrats from diametrically opposite points of view, but after all it must not be forgotten that you criticised the Constitutional-Democrats for being *excessively* democratic, while we criticised them for being *insufficiently* democratic! The Machians criticise Kant for being too much of a materialist, while we criticise him for not being enough of a materialist. The Machians criticise Kant from the Right, we from the Left.

The Humean Schulze and the subjective idealist Fichte may be taken as examples of the former category of critics in the history of classical German philosophy. As we have already seen, they try to obliterate the "realistic" elements of Kantianism. Just as Schulze and Fichte criticised Kant himself, so the Humean empirio-criticists and the subjective idealist-immanentists criticised the German Neo-Kantians of the second half of the nineteenth century. The line of Hume and Berkeley reappeared in a slightly renovated verbal garb. Mach and Avenarius reproached Kant not because his treatment of the thing-in-itself was not sufficiently realistic, not sufficiently materialistic, but because he *assumed* its existence; not because he refused to deduce causality and necessity in nature from objective reality, but because he assumed causality and necessity at all (except perhaps purely "logical" necessity). The immanentists were at one with the empirio-criticists, also criticising Kant from the Humean and Berkeleian standpoint. For instance, Leclair in 1879, in the work in which he praised Mach as a remarkable philosopher, reproached Kant for his "inconsistency and connivance at realism" as expressed in the concept of the *"thing-in-itself"*—that "nominal residuum of vulgar realism" (*Der Realismus der modernen Naturwissenschaft, usw.*, S. 9). Leclair calls materialism "vulgar realism," in order "to make it stronger." "In our opinion," writes Leclair, "all those parts of the Kantian theory which gravitate towards *realismus vulgaris* should be vanquished and eliminated as being inconsistencies and bastard *(zwitterhafte)* products of the idealist point of view" (p. 41). "The inconsistencies and contradictions in the Kantian theory of knowledge [arise from] the amalgamation *(Verquickung)* of idealist criticism with still unvanquished remnants of realistic dogmatism" (p. 170). By realistic dogmatism Leclair means materialism.

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[1] V. M. Purishkevich (1870-1920), monarchist and extreme reactionary.—*Trans.*

Another immanentist, Johannes Rehmke, reproached Kant because he *realistically walled himself* off from Berkeley by the thing-in-itself (Johannes Rehmke, *Die Welt als Wahrnehmung und Begriff,* Berlin 1880, S. 9). "The philosophical activity of Kant bore ... an essentially polemical character: with the thing-in-itself he turned against German rationalism [*i.e.*, the old fideism of the eighteenth century], and with pure contemplation against English empiricism" (p. 25). "I would compare the Kantian thing-in-itself with a movable lid placed over a pit: the thing looks so innocent and safe; one steps on it and suddenly falls into ... the *'world-in-itself'* " (p. 27). That is why Kant is not liked by the associates of Mach and Avenarius, the immanentists; they do not like him because in some respects he approaches the "pit" of materialism!

And here are some examples of the criticism of Kant from the Left. Feuerbach reproaches Kant not for his "realism," but for his *idealism,* and describes his system as "idealism based on empiricism" (*Werke,* Bd. II, S. 296).

Here is a particularly important remark on Kant by Feuerbach, "Kant says: If we regard—as we should—the objects of our perceptions as mere appearances, we thereby admit that at the bottom of appearances is a thing-in-itself, although we do not know how it is actually constructed, but only know its appearance, *i.e.*, the manner in which our senses are affected by this unknown something. Hence, our reason, by the very fact that it accepts appearances, also admits the existence of things-in-themselves; and to that extent we can say that to entertain an idea of such entities which lie at the bottom of appearances, and consequently are but thought entities, is not only permissible, but unavoidable. . . ." Having selected a passage from Kant where the thing-in-itself is regarded merely as a mental thing, a thought entity, and not a real thing, Feuerbach directs his whole criticism against it. ". . . Therefore," he says, "the objects of the senses [the objects of experience] are for the mind only appearances, and not truth. . . . Yet the thought entities are not actual objects for the mind! The Kantian philosophy is a contradiction between subject and object, between entity and existence, thinking and being. Entity is left to the mind, existence to the senses. Existence without entity [*i.e.*, the existence of appearances without objective reality] is mere appearance—the sensible things—while entity without existence is mere thought—the thought entities, the *noumena*; they are thought of, but they lack existence—at least for us—and objectivity; they are the things-in-themselves, the true things, but they are not real things. . . . But what a contradiction, to sever truth from reality, reality from truth!" (*Werke,* II, S. 302-03). Feuerbach reproaches Kant not because he assumes things-in-themselves, but because he does not grant them reality, *i.e.*, objective reality, because he regards them as mere thought, "thought entities," and not as "entities possessing existence," *i.e.*, real and actually existing. Feuerbach rebukes Kant for deviating from materialism.

"The Kantian philosophy is a contradiction," Feuerbach wrote to Bolin on March 26, 1858, "it inevitably leads either to Fichtean idealism or to sensationalism. The former conclusion belongs to the past ... the latter to the present and the future" (Karl Grün, *Ludwig Feuerbach,* Bd. II, S. 49). We have already seen that Feuerbach advocates objective sensationalism, *i.e.,* materialism. The new turn from Kant to agnosticism and idealism, to Hume and Berkeley, is undoubtedly *reactionary,* even from Feuerbach's standpoint. And his ardent follower, Albrecht Rau, who together with the merits of Feuerbach also adopted his faults, which were eliminated by Marx and Engels, criticised Kant wholly in the spirit of his teacher: "The Kantian philosophy is an amphibole [ambiguity]; it is both materialism and idealism, and the key to its essence lies in its dual nature. As a materialist or an empiricist, Kant cannot help conceding things an existence *(Wesenheit)* outside us. But as an idealist he could not rid himself of the prejudice that the soul is an entity totally different from sensible things. Hence there are real things and a human mind which apprehends those things. But how can the mind approach things totally different from itself? The way out [adopted by Kant] is as follows: the mind possesses certain *a priori* knowledge, in virtue of which things must appear to it as they do. Hence, the fact that we understand things as we do is a fact of our creation. For the mind which lives within us is nothing but the divine mind, and just as God created the world out of nothing, so the human mind creates out of things something which they are not in themselves. Thus Kant guarantees real things their existence as 'things-in-themselves.' Kant, however, needed the soul, because immortality was for him a moral postulate. The 'thing-in-itself,' gentlemen [says Rau, addressing the Neo-Kantians in general and the muddleheaded Lange in particular, who falsified the *History of Materialism*], is what separates the idealism of Kant from the idealism of Berkeley; it spans the gap between materialism and idealism. Such is my criticism of the Kantian philosophy, and let those who can refute it...." "For the materialist a distinction between *a priori* knowledge and the 'thing-in-itself' is absolutely superfluous, for since he nowhere breaks the continuity of nature, since he does not regard matter and mind as two fundamentally different things, but as two aspects of one and the same thing, he need not resort to artifice in order to bring the mind and the thing into conjunction."[1]

Further, Engels, as we have seen, rebuked Kant for being an agnostic, but not for his deviation from consistent agnosticism. Lafargue, Engels' disciple, argued in 1900 against the Kantians (amongst whom at that time was Charles Rappoport) as follows:

"... At the beginning of the nineteenth century our bourgeoisie, having completed its task of revolutionary destruction, began to repudiate its Voltairean and free-thinking philosophy. Catholicism, which the master decorator Chateaubriand painted in romantic colours (*peinturlurait*), was restored to fashion, and Sebastian Mercier imported the idealism of Kant in order to give the *coup de grace* to the materialism of the Encyclopædists, whose protagonists had been guillotined by Robespierre.

"At the end of the nineteenth century, which will go down in history as the 'bourgeois century,' the intellectuals attempted to crush the materialism of Marx and Engels beneath the philosophy of Kant. The reactionary movement started in Germany—without offence to the socialist *integralistes* who would like to ascribe the honour to their chief, Malon. But Malon himself had been to the school of Höchberg, Bernstein and the other disciples of Dühring, who were reforming Marxism in Zurich. [Lafargue is referring to the ideological movement in German socialism in the later 'seventies.] It is to be expected that Jaurès, Fournière and our other intellectuals will also treat us to Kant as soon as they have mastered his terminology.... Rappoport is mistaken when he assures us that for Marx the 'ideal and the real are identical.' In the first place we never employ such metaphysical phraseology. An idea is as real as the object of which it is the reflection in the brain.... To provide a little recreation for the comrades who have to acquaint themselves with bourgeois philosophy, I shall explain the substance of this famous problem which has so much exercised spiritualist minds.

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[1] Albrecht Rau, *Ludwig Feuerbachs Philosophie, die Naturforschung und die philosophische Kritik der Gegenwart*, Leipzig 1882, S. 87-89.

"The workingman who eats sausage and receives a hundred sous a day knows very well that he is robbed by the employer and is nourished by pork meat, that the employer is a robber and that the sausage is pleasant to the taste and nourishing to the body. Not at all, say the bourgeois sophists, whether they are called Pyrrho, Hume or Kant. His opinion is personal, an entirely subjective opinion; he might with equal reason maintain that the employer is his benefactor and that the sausage consists of chopped leather, for he cannot know *things-in-themselves.*

"The question is not properly put, that is the whole trouble.... In order to know an object, man must first verify whether his senses deceive him or not.... The chemists have gone still further—they have penetrated into bodies, they have analysed them, decomposed them into their elements, and then performed the reverse procedure, they have recomposed them from their elements. And from the moment that man is able to produce things for his own use from these elements, he may, as Engels says, assert that he knows *the bodies themselves*. The God of the Christians, if he existed and if he created the world, could do no more."[1]

We have taken the liberty of making this long quotation in order to show how Lafargue understood Engels and how he criticised Kant from the Left, not for those aspects of Kantianism which distinguish it from Humism, but for those which are common to both Kant and Hume; not for his assumption of the thing-in-itself, but for his inadequately materialist view of it.

And lastly, Karl Kautsky in his *Ethics* also criticises

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[1] Paul Lafargue, "*Le matérialisme de Marx et l'idéalisme de Kant,*" *Le Socialiste,* February 25, 1900.

Kant from a standpoint diametrically opposed to that of Hume and Berkeley. "That I see green, red and white," he writes, arguing against Kant's epistemology, "is grounded in my faculty of sight. But that green is something different from red testifies to something that lies outside of me, to real differences between the things. . . . The *relations* and *differences* between the things themselves revealed to me by the individual space and time concepts . . . are *real* relations and differences of the external world, not conditioned by the nature of my perceptive faculty. . . . If this were really so [if Kant's doctrine of the ideality of time and space were true], we could know nothing about the world outside us, not even that it exists."

Thus the *entire school* of Feuerbach, Marx and Engels turned from Kant to the Left, to a complete rejection of all idealism and of all agnosticism. But our Machians followed the *reactionary* trend in philosophy, Mach and Avenarius, who criticised Kant from the standpoint of Hume and Berkeley. Of course, it is the sacred right of every citizen, and particularly of every intellectual, to follow any ideological reactionary he likes. But when people who have radically severed relations with the very *foundations of Marxism* in philosophy begin to dodge, confuse matters, hedge and assure us that they "too" are Marxists in philosophy, that they are "almost" in agreement with Marx, and have only slightly "supplemented" him—the spectacle is a far from pleasant one.

2. HOW THE "EMPIRIO-SYMBOLIST" YUSHKEVICH RIDICULED THE "EMPIRIO-CRITICIST" CHERNOV

"It is, of course, amusing," writes Mr. P. Yushkevich, "to see how Mr. Chernov tries to make the agnostic positivist-Comtean and Spencerian, Mikhailovsky, a forerunner of Mach and Avenarius" (*op. cit.*, p. 73).

First of all, what is amusing here is Mr. Yushkevich's astonishing ignorance. Like all Voroshilovs, he conceals this ignorance under a display of erudite words and names. The passage quoted is from a paragraph devoted to the relation between Machism and Marxism. And although he undertakes to treat of this subject, Mr. Yushkevich does not know that for Engels (as for every materialist) the adherents of the Humean line and the adherents of the Kantian line are equally agnostics. Therefore, to contrast agnosticism generally with Machism, when even Mach himself confesses to being a follower of Hume, is to prove oneself an ignoramus in philosophy. The phrase "agnostic positivism" is also absurd, for the adherents of Hume in fact call themselves positivists. Mr. Yushkevich, who has taken Petzoldt as his teacher, should have known that Petzoldt definitely regards empirio-criticism as positivism. And finally, to drag in the names of Auguste Comte and Herbert Spencer is again absurd, for Marxism rejects not what distinguishes one positivist from another, but what is common to both and what makes a philosopher a positivist instead of a materialist.

Our Voroshilov needed this display of words so as to "mesmerise" his reader, to stun him with a cacophony of words, to distract his attention away *from the essence of the matter* to empty trifles. And the essence of the matter is the radical difference between materialism and the broad current of positivism, which *includes* Auguste Comte, Herbert Spencer, Mikhailovsky, a number of Neo-Kantians, and Mach and Avenarius. The essence of the matter has been very accurately expressed by Engels in his *Ludwig Feuerbach,* where he places *all* the Kantians and Humeans of that period (*i.e.,* the eighties of the last century) in the camp of wretched eclectics, pettifoggers (*Flohknacker:* literally, flea-crackers), and so on. To whom this characterisation can and must apply is a question on which our Voroshilovs did not wish to reflect. And since they are incapable of reflecting, we shall cite one illuminating comparison. Engels, speaking both in 1888 and 1891 of the Kantians and Humeans in general, mentions *no* names. The only reference Engels makes to a book is his reference to the work of Starcke on Feuerbach, which Engels analysed. "Starcke," says Engels, "takes great pains to defend Feuerbach against the attacks and doctrines of the vociferous lecturers who today go by the name of philosophers in Germany. For people who are interested in this afterbirth of German classical philosophy this is a matter of importance; for Starcke himself it may have appeared necessary. We, however, will spare the reader this" (*Ludwig Feuerbach,* p. 42).

Engels wanted to "spare the reader," that is, to save the Social-Democrats from a pleasant acquaintance with the degenerate chatterboxes who call themselves philosophers. And who are implied by this "afterbirth"?

We open Starcke's book (C. N. Starcke, *Ludwig Feuerbach,* Stuttgart, 1885) and find constant references to the adherents of *Hume and Kant.* Starcke dissociates Feuerbach from these two trends. Starcke quotes in this connection *A. Riehl, Windelband* and *A. Lange* (pp. 3, 18-19, 127, etc., in Starcke).

We open Avenarius' *Der menschliche Weltbegriff,* which appeared in 1891, and on page 120 of the first German edition we read: "The final result of our analysis concurs—although not absolutely *(durchgehend)* in the measure of the various points of view—with that reached by other investigators, for example, *E. Laas, E. Mach, A. Riehl, W. Wundt.* See also *Schopenhauer.*"

Whom was our Voroshilov-Yushkevich jeering at?

Avenarius has not the slightest doubt as to his kinship in principle—not regarding any particular question, but regarding the "final result" of empirio-criticism—to the *Kantians* Riehl and Laas and to the *idealist* Wundt. He mentions Mach between the two Kantians. And, indeed, are they not all one company, since Riehl and Laas purified Kant à la Hume, and Mach and Avenarius purified Hume à la Berkeley?

Is it surprising that Engels wished to "spare" the German workers, to save them from a close acquaintance with this whole company of "flea-cracking" university lecturers?

Engels could spare the German workers, but the Voroshilovs do not spare the Russian reader.

It should be noted that an essentially eclectic combination of Kant and Hume, or Hume and Berkeley, is possible, so to speak, in varying proportions, by laying principal stress now on one, now on another element of the mixture. We saw above, for instance, that only one Machian, H. Kleinpeter, openly admits that he and Mach are solipsists (*i.e.*, consistent Berkeleians). On the other hand, the Humean trend in the views of Mach and Avenarius is emphasised by many of their disciples and followers: Petzoldt, Willy, Pearson, the Russian empirio-criticist Lessevich, the Frenchman Henri Delacroix[1] and others. We shall cite one example—an especially eminent scientist who in philosophy also combined Hume with Berkeley, but who emphasised the materialist elements of this mixture. He is Thomas Huxley, the famous English scientist, who gave currency to the term "agnostic" and whom Engels undoubtedly had chiefly and primarily in mind when he spoke of English agnosticism. Engels in 1892 called this type of agnostics "shamefaced materialists." James Ward, the English spiritualist, in his book *Naturalism and Agnosticism,* wherein he chiefly attacks the "scientific champion of agnosticism," Huxley (Vol. II, p. 229), bears out Engels' opinion when he says: "In Huxley's case indeed the leaning towards the primacy of the physical side ["series of elements" Mach calls it] is often so pronounced that it can hardly be called parallelism at all. Spite of his vehement repudiation of the title of materialist as an affront to his untarnished agnosticism, I know of few recent writers who on occasion better deserve the title" (Vol. II, pp. 30-31). And James Ward quotes the following statements by Huxley in confirmation of his opinion: " 'Anyone who is acquainted with the history of science will admit, that its progress has, in all ages, meant, and now more than ever means, the extension of the province of what we call matter and causation, and the concomitant gradual banishment from all regions of human thought of what we call spirit and spontaneity.' " Or: " 'It is in itself of little moment whether we express the phenomena of matter in terms of spirit, or the phenomena of spirit in terms of matter—each statement has a certain relative truth ["relatively stable complexes of elements," according to Mach]. But with a view to the progress of science, the materialistic terminology is in every way to be preferred. For it connects thought with the other phenomena of the universe, ... whereas, the alternative, or spiritualistic, terminology is utterly barren, and leads to nothing but obscurity and confusion of ideas. Thus there can be little doubt, that the further science advances, the more extensively and consistently will all the phenomena of Nature be represented by materialistic formulæ and symbols' " (Vol. I, p. 17-19).

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[1] *Bibliothèque du congrès international de la philosophie,* Vol. IV, Henri Delacroix, *David Hume et la philosophie critique.* Among the followers of Hume the author includes Avenarius and the immanentists in Germany, Ch. Renouvier and his school (the neo-criticists) in France.

So argued the "shamefaced materialist" Huxley, who refused to accept materialism, regarding it as "metaphysics" that illegitimately goes beyond "groups of sensations." And this same Huxley wrote: " 'If I were obliged to choose between absolute materialism and absolute idealism I should feel compelled to accept the latter alternative.... Our one certainty is the existence of the mental world' " (James Ward, Vol. II, p. 216).

Huxley's philosophy is as much a mixture of Hume and Berkeley as is Mach's philosophy. But in Huxley's case the Berkeleian streaks are incidental, and agnosticism serves as a fig-leaf for materialism. With Mach the "colouring" of the mixture is a different one, and Ward, the spiritualist, while bitterly combating Huxley, pats Avenarius and Mach affectionately on the back.

3. THE IMMANENTISTS AS COMRADES-IN-ARMS OF MACH AND AVENARIUS

In speaking of empirio-criticism we could not avoid repeatedly mentioning the philosophers of the so-called immanentist school, the principal representatives of which are Schuppe, Leclair, Rehmke, and Schubert-Soldern. It is now necessary to examine the relation of empirio-criticism to the immanentists and the nature of the philosophy preached by the latter.

In 1902 Mach wrote: "... Today I see that a host of philosophers—positivists, empirio-criticists, adherents of the immanentist philosophy—as well as a very few scientists, have all, without knowing anything of each other, entered on paths which, in spite of their individual differences, converge almost towards one point" (*Analyse der Empfindungen,* Vorwort. zur 4. Auflage). Here we must first note Mach's unusually frank admission that *very few* scientists are followers of the supposedly "new," but in truth very old, Humean-Berkeleian philosophy. Secondly, extremely important is Mach's opinion that this "new" philosophy is a broad *current* in which the immanentists are on the same footing as the empirio-criticists and the positivists. "Thus"—repeats Mach in the introduction to the Russian translation of the *Analyse der Empfindungen* (1906)—"there is a common movement ..." (p. 4). "My position [Mach says in another place], moreover, borders closely on that of the representatives of the immanentist philosophy.... I found hardly anything in this book [*i.e.,* Schuppe, *Grundriß der Erkenntnistheorie und Logik*] with which, with perhaps a very slight change, I would not gladly agree" (p. 46). Mach considers that Schubert-Soldern is also "following close paths" (p. 4), and as to Wilhelm Schuppe, Mach even *dedicates* to him his latest work, the summary so to speak of his philosophical labours, *Erkenntnis und Irrtum.*

Avenarius, the other founder of empirio-criticism, wrote in 1894 that he was "gladdened" and "encouraged" by Schuppe's sympathy for empirio-criticism, and that the "differences" between him and Schuppe "exist, perhaps, only temporarily" *(vielleicht nur einstweilen noch bestehend).*[1] And, finally, J. Petzoldt, whose teachings Lessevich regards as the last word in empirio-criticism, *openly acclaims the trio*—Schuppe, Mach and Avenarius—*as the leaders of*

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[1] *Vierteljahrsschrift für wissenschaftliche Philosophie,* 1894, 18. Jahrg., Heft 1, S. 29.

the "new" trend. (*Einführung in die Philosophie der reinen Erfahrung* Bd. II, 1904, S. 295; *Das Weltproblem,* 1906, S. v. und 146). On this point Petzoldt is definitely opposed to Willy (*Einf.*, Bd. II, S. 321), probably the only outstanding Machian who felt ashamed of such a kinship as Schuppe's and who tried to dissociate himself from him fundamentally, for which this disciple was reprimanded by his beloved teacher Avenarius. Avenarius wrote the words about Schuppe above quoted in a comment on Willy's article against Schuppe, adding that Willy's criticism perhaps "was put more strongly than was really necessary" (*Vierteljahrsschrift für wissenschaftliche Philosophie,* 18. Jahrg., 1894, S. 29; which also contains Willy's article against Schuppe).

Having acquainted ourselves with the empirio-criticists' opinion of the immanentists, let us examine the immanentists' opinion of the empirio-criticists. We have already mentioned the opinion uttered by Leclair in 1879. Schubert-Soldern in 1882 explicitly expressed his "agreement" "in part with the elder Fichte" (*i.e.,* the distinguished representative of subjective idealism, Johann Gottlieb Fichte, whose son was as inept in philosophy as was the son of Joseph Dietzgen), and "with Schuppe, Leclair, *Avenarius* and partly with Rehmke," while *Mach (Erh. d. Arb.)* is cited with particular gusto in opposition to "natural-historical metaphysics"[1] —the term given to natural-historical materialism by all the reactionary university lecturers and professors in Germany. In 1893, after the appearance of Avenarius' *Der Menschliche Weltbegriff,* W. Schuppe hailed this work in *An Open Letter to Prof. Avenarius* as a "confirmation of the naïve realism" which he (Schuppe) himself advocated. "My conception of thought," Schuppe wrote, "excellently harmonises with your [Avenarius'] pure experience."[2] Then, in 1896, Schubert-Soldern, summarising the "methodological trend in philosophy" on which he "bases himself," traces his genealogy from Berkeley and Hume down through *F. A. Lange* ("the real beginning of our movement in Germany dates from Lange"), and then through Laas, Schuppe and Co., *Avenarius* and *Mach, Riehl* (among the Neo-Kantians), Ch. Renouvier (among the Frenchmen), etc.[1] Finally, in their programmatic "Introduction" printed in the first issue of the philosophical organ of the immanentists, alongside a declaration of war on materialism and an expression of sympathy with Ch. Renouvier, we read: "Even in the camp of the scientists themselves voices of individual thinkers are being raised sermonising against the growing arrogance of their colleagues, against the unphilosophical spirit which has taken possession of the natural sciences. Thus the physicist Mach. . . . On all hands fresh forces are stirring and are working to destroy the blind faith in the infallibility of the natural sciences, and once again people are beginning to seek for other paths into the profundities of the mysterious, a better entrance to the house of truth."[2]

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[1] Dr. Richard von Schubert-Soldern, *Ueber Transzendenz des Objekts und Subjekts,* 1882, S. 37 and § 5. *Cf.* also his *Grundlagen einer Erkenntnistheorie,* 1884, S. 3.

[2] *Vierteljahrsschrift für wissenschaftliche Philosophie,* 17. Jahrg. 1893, S. 384.

A word or two about Ch. Renouvier. He is the head of the influential and widespread school in France known as the neo-criticists. His theoretical philosophy is a combination of the phenomenalism of Hume and the apriorism of Kant. The thing-in-itself is absolutely rejected. The connection of phenomena, order and law is declared to be *a priori*; law is written with a capital letter and is converted into the basis of religion. The Catholic priests go into raptures over this philosophy. The Machian Willy scornfully refers to Renouvier as a "second apostle Paul," as "an obscurantist of the first water" and as a "casuistic preacher of free will" (*Gegen die Schulweisheit*, S. 129). And it is such co-thinkers of the immanentists who *warmly greet* Mach's philosophy. When his *Mechanik* appeared in a French translation, the organ of the neo-criticists—*L'Année philosophique*—edited by Pillon, a collaborator and disciple of Renouvier, wrote: "It is unnecessary to speak of the extent to which, in this criticism of substance, the thing, the thing-in-itself, Mach's positive science agrees with neo-critical idealism" (Vol. XV, 1904, p. 179).

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[1] Dr. Richard von Schubert-Soldern, *Das menschliche Glück und die soziale Frage*, 1896, S. v u. vi.

[2] *Zeitschrift für immanente Philosophie*, Bd. I, Berlin 1896, S. 6, 9.

As for the Russian Machians, they are all ashamed of their kinship with the immanentists, and one of course could not expect anything else of people who did not deliberately adopt the path of Struve, Menshikov, and the like. Bazarov alone refers to "certain representatives of the immanentist school" as "realists."[1] Bogdanov briefly *(and in fact falsely)* declares that "the immanentist school is only an intermediate form between Kantianism and empirio-criticism" (*Empirio-Monism,* Bk. III, p. xxii). V. Chernov writes: "Generally speaking, the immanentists approach positivism in only one aspect of their theory, in other aspects they go far beyond it" (*Philosophical and Sociological Studies,* p. 37). Valentinov says that "the immanentist school clothed these (Machian) ideas in an unsuitable form and found themselves in the blind alley of solipsism" (*op. cit.*, p. 149). As you see, you pay your money and take your choice: constitution and salmon mayonnaise, realism and solipsism. Our Machians are afraid to tell the plain and clear truth about the immanentists.

The fact is that the immanentists are rank reactionaries, open advocates of fideism, unadulterated in their obscurantism. There is *not one* of them who has not *frankly* made his more theoretical works on epistemology a defence of religion and a justification of mediævalism of one kind or another. Leclair, in 1879, advocated his philosophy as one that satisfies "all the needs of a religiously inclined mind" (*Der Realismus,* etc., S. 73). J. Rehmke, in 1880, dedicated his "theory of knowledge" to the Protestant pastor Biedermann and closed his book by preaching not a supersensible God, but God as a "real concept" (it was for this reason presumably, that Bazarov ranked "certain" immanentists among the "realists"), and moreover the "objectivisation of this real concept is relegated to practical life," while Biedermann's "Christian dogmatism" is declared to be a model of "scientific theology" (J. Rehmke, *Die Welt als Wahrnehmung und Begriff,* Berlin 1880, S. 312). Schuppe in the *Zeitschrift für immanente Philosophie* assures us that though the immanentists deny transcendentalism, God and the future life do not come under this concept (*Zeitschrift für immanente Philosophie,* Bd. II, S. 52). In his *Ethik* he insists on the "connection of the moral law ... with the metaphysical world conception" and condemns the separation of the church from the state as a "senseless phrase" (Dr. Wilhelm Schuppe, *Grundzüge der Ethik und Rechtsphilosophie,* Breslau 1881, S. 181, 325). Schubert-Soldern in his *Grundlage einer Erkenntnistheorie* deduces both the pre-existence of the *self* before the body and the after-existence of the *self* after the body, *i.e.,* the immortality of the soul (p. 82), etc. In *Die soziale Frage,* arguing against Bebel, he defends, together with "social reforms," suffrage based on class distinction, and says that the "Social-Democrats ignore the fact that without the divine gift of unhappiness there could be no happiness" (p. 330), and thereupon laments the fact that materialism "prevails" (p. 242): "he who in our time believes in a life beyond, or even in its possibility, is considered a fool" *(ibid.).*

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[1] "Realists in modern philosophy—certain representatives of the immanentist school who have emerged from Kantianism, the school of Mach-Avenarius, and many other kindred movements—find that there are absolutely no grounds for rejecting the basis of naïve realism" (*Studies,* etc., p. 26).

And German Menshikovs like these, no less obscurantists of the first water than Renouvier, live in lasting concubinage with the empirio-criticists. Their theoretical kinship is incontestable. There is no more Kantianism in the immanentists than in Petzoldt or Pearson. We saw above that they themselves regard themselves as disciples of Hume and Berkeley, an opinion of the immanentists that is generally recognised in philosophical literature. In order to show clearly what epistemological premises these comrades-in-arms of Mach and Avenarius proceed from, we shall quote some fundamental theoretical propositions from the works of immanentists.

Leclair in 1879 had not yet invented the term "immanent," which really signifies "experiential," "given in experience," and which is just as spurious a label for concealing corruption as the labels of the European bourgeois parties. In his first work, Leclair frankly and explicitly calls himself a "critical idealist" (*Der Realismus*, etc., S. 11, 21, 206, etc.). In this work he criticises Kant, as we have already seen, for his concessions to materialism, and clearly indicates his *own* path *away from* Kant to Fichte and Berkeley. Leclair fights materialism in general and *the tendency towards materialism displayed by the majority of scientists* in particular as mercilessly as Schuppe, Schubert-Soldern and Rehmke.

"If we return," Leclair says, "to the standpoint of critical idealism, if we do not attribute a transcendental existence [*i.e.*, an existence outside of human consciousness] to nature or the processes of nature, then for the subject the aggregate of bodies and his own body, in so far as he can see and feel it, together with all its changes, will be a directly given phenomenon of spatially connected co-existences and successions in time, and the whole explanation of nature will reduce itself to stating the laws of these co-existences and successions" (p. 21).

Back to Kant!—said the reactionary Neo-Kantians. Back to Fichte and Berkeley!—is *essentially* what the reactionary immanentists are saying. For Leclair, all that exists consists of "*complexes of sensations*" (p. 38), while certain classes of properties *(Eigenschaften)*, which act upon our sense-organs, he designates, for example, by the letter M, and other classes, which act upon other objects of nature, by the letter N (p. 150, etc.). Moreover, Leclair speaks of nature as the "phenomena of the consciousness" (*Bewußtseinsphänomen*) not of a single person, but of "mankind" (pp. 55-56). If we remember that Leclair published his book in Prague, where Mach was professor of physics, and that Leclair cites with rapture only Mach's *Erhaltung der Arbeit*, which appeared in 1872, the question involuntarily arises: ought we not to regard the advocate of fideism and the frank idealist Leclair as the true progenitor of the "original" philosophy of Mach?

As for Schuppe, who, according to Leclair,[1] arrived at the "same results," he, as we have seen, really claims to defend "naïve realism," and in his *Open Letter to Prof. Avenarius* bitterly complains of the "established perversion of my [Schuppe's] theory of knowledge to subjective idealism." The true nature of the crude forgery which the immanentist Schuppe calls a defence of realism is quite clear from his rejoinder to Wundt, who did not hesitate to class the immanentists with the Fichteans, the subjective idealists (*Philosophische Studien, loc. cit.,* S. 386, 397, 407).

"In my case," Schuppe *retorts* to Wundt, "the proposition 'being is consciousness' means that consciousness without the external world is inconceivable, that the latter belongs to the former, *i.e.*, the absolute connection *(Zusammengehörigkeit)* of the one with the other, which I have so often asserted and explained and in which the two constitute the primary whole of being."[2]

One must be extremely naïve not to discern unadulterated subjective idealism in such "realism"! Just think: the external world "belongs to consciousness" and is in *absolute* connection with it! The poor professor was indeed slandered by the "established" practice of ranking him with the subjective idealists! Such a philosophy completely coincides with Avenarius' "principal co-ordination"; no reservations and protests on the part of Chernov and Valentinov can sunder them; both philosophies will be consigned together to the museum of reactionary fabrications of German professordom. As a curiosity once more testifying to Valentinov's lack of judgment, let us note that he calls Schuppe a solipsist (it goes without saying that Schuppe vowed and swore that he was not a solipsist—and wrote articles specially dealing with this subject—just as vehemently as did Mach, Petzoldt, and Co.), and is highly delighted with Bazarov's article in the *Studies*! I should like to translate into German Bazarov's dictum that "sense-perception *is* the reality existing outside us" and forward it to some more or less intelligent immanentist. He would embrace and kiss Bazarov as heartily as the Schuppes, Leclairs and Schubert-Solderns embraced Mach and Avenarius. For Bazarov's dictum is the *alpha and omega* of the doctrines of the immanentist school.

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[1] *Beiträge zu einer monistischen Erkenntnistheorie,* Breslau, 1882, S. 10.

[2] Wilhelm Schuppe, *"Die immanente Philosophie und Wilhelm Wundt," Zeitschrift für immanente Philosophie,* Bd. II, S. 195.

And here, lastly, is Schubert-Soldern. "The materialism of natural science," the "metaphysics" of recognising the objective reality of the external world, is the chief enemy of this philosopher (*Grundlagen einer Erkenntnistheorie,* Leipzig 1884, p. 31 and the whole of Chapter II: *Die Metaphysik der Naturwissenschaft*). "Natural science abstracts from all relations of consciousness" (p. 52)—that is the chief evil (and that is just what constitutes materialism!). For the individual cannot escape from "sensations and, hence, from a state of consciousness" (pp. 33-34). Of course, Schubert-Soldern admitted in 1896, my standpoint is *epistemological solipsism* (*Die soziale Frage,* S. x), but not "metaphysical," not "practical" solipsism. "What is given us immediately is sensations, complexes of constantly changing sensations" (*Ueber Transzendenz des Objekts und Subjekts,* S. 73).

"Marx took the material process of production," says Schubert-Soldern, "as the cause of inner processes and motives, in the same way (and just as falsely) as natural science regards the common [to humanity] external world as the cause of the individual inner worlds" (*Die soziale Frage,* S. xviii). That Marx's historical materialism is connected with natural-historical materialism and philosophical materialism in general, it does not even occur to this comrade-in-arms of Mach to doubt.

"Many, perhaps the majority, will be of the opinion that from the standpoint of epistemological solipsism no metaphysics is possible, *i.e.,* that metaphysics is always transcendental. Upon more mature reflection I cannot concur with this opinion. Here are my reasons.... The immediate foundation of all that is given is the spiritual (solipsist) connection, the central point of which is the individual Self (the individual realm of thought) with its body. The rest of the world is inconceivable without this Self, just as this Self is inconceivable without the rest of the world. With the destruction of the individual Self the world is also annihilated, which appears impossible—and with the destruction of the rest of the world, nothing remains for my individual Self, for the latter can be separated from the world only logically, but not in time and space. Therefore my individual Self must continue to exist after my death also, if the entire world is not to be annihilated with it..." (*ibid.,* p. xxiii).

The "principal co-ordination," "complexes of sensations" and the rest of the Machian banalities render faithful service to the proper people!

"... What is the hereafter *(Jenseits)* from the solipsist point of view? It is only a possible future experience for me..." *(ibid.).* "Spiritualism... would be obliged to prove the existence of the *Jenseits.* But at any rate the materialism of natural science cannot be brought into the field against spiritualism, for this materialism, as we have seen, is only one aspect of the world process within the all-embracing spiritual connection" (=the "principal co-ordination") (p. xxiv).

All this is said in that philosophical introduction to *Die soziale Frage* (1896) wherein Schubert-Soldern *all the time* appears arm in arm with Mach and Avenarius. Only for the handful of Russian Machians does Machism serve exclusively for purposes of intellectual prattle. In its native country its role as a flunkey to fideism is openly proclaimed!

4. WHITHER IS EMPIRIO-CRITICISM TENDING?

Let us now cast a glance at the development of Machism after Mach and Avenarius. We have seen that their philosophy is a hash, a pot-pourri of contradictory and disconnected epistemological propositions. We must now examine how and whither, *i.e.,* in what direction, this philosophy is developing, for this will help us to settle certain "disputable" questions by referring to indisputable historical facts. And indeed, in view of the eclecticism and incoherence of the initial philosophical premises of the trend we are examining, varying interpretations of it and sterile disputes over particulars and trifles are absolutely inevitable. But empiriocriticism, like every ideological current, is a living thing, which grows and develops, and the fact that it is growing in one direction or another will help us more than long arguments to settle the *basic* question as to what the real essence of this philosophy is. We judge a person not by what he says or thinks of himself but by his actions. And we must judge philosophers not by the labels they give themselves ("positivism," the philosophy of "pure experience," "monism" or "empirio-monism," the "philosophy of natural science," etc.) but by the manner in which they actually settle fundamental theoretical questions, by their associates, by what they are teaching and by what they have taught their disciples and followers.

It is this last question which interests us now. Everything essential was said by Mach and Avenarius more than twenty years ago. It was bound to become clear in the interval *how* these "leaders" were *understood* by those who wanted to understand them, and whom they themselves (at least Mach, who has outlived his colleague) regard as their successors. To be specific, let us take those who themselves claim to be disciples of Mach and Avenarius (or their adherents) and whom Mach himself ranks as such. We shall thus obtain a picture of empirio-criticism as a philosophical *current*, and not as a collection of literary oddities.

In Mach's Introduction to the Russian translation of the *Analyse der Empfindungen*, Hans Cornelius is recommended as a "young investigator" who is following "if not quite the same, at least very close paths" (p. 4). In the text of the *Analyse der Empfindungen* Mach once again "mentions with pleasure the works" of Cornelius and others, "who have disclosed the kernel of Avenarius' ideas and have developed them further" (p. 40). Let us take Cornelius' *Einleitung in die Philosophie* (German ed., 1903) and we find that its author also speaks of his endeavour to follow in the footsteps of Mach and Avenarius (pp. viii, 32). We have before us then a *disciple acknowledged by the teacher.* This disciple also begins with sensations-elements (pp. 17, 24), categorically declares that he confines himself to *experience* (p. vi), calls his views "consistent or epistemological empiricism" (p. 335), emphatically condemns the "one-sidedness" of idealism and the "dogmatism" of both the idealists and the materialists (p. 129), vehemently denies the possible "misconception" (p. 123) that his philosophy implies the recognition of the world as existing in the mind of man, flirts with naïve realism no less skilfully than Avenarius, Schuppe or Bazarov ("a visual, as well as every other sense-perception, is located where we find it, and only where we find it, that is to say, where the naïve mind, untouched by a false philosophy, localises it"—p. 125)—and this disciple, acknowledged as such by his teacher, arrives at *immortality* and *God.* Materialism—thunders this police sergeant in a professorial chair, I beg your pardon, this disciple of the "recent positivists"—converts man into an automaton. "It need hardly be said that together with the belief in the freedom of our decisions it destroys all considerations of the moral value of our actions and our responsibility for this value. Just as little room is left for the idea of the continuation of our life after death" (p. 116). The final note of the book is: "Education [of the youth stultified by this man of science, presumably] is necessary not only for action but ... above all ... to inculcate veneration *(Ehrfurcht)* not for the transitory values of a fortuitous tradition, but for the imperishable values of duty and beauty, for the divine *(dem Göttlichen)* within us and without" (p. 357).

Compare this with Bogdanov's assertion that "there is *absolutely no room*" (Bogdanov's italics) and "there cannot be any room"[1] for the idea of God, freedom of the will and immortality of the soul in Mach's philosophy in view of his denial of every "thing-in-itself" (p. xii). While Mach in this same book (p. 293) declares that "there is no Machian philosophy," and recommends not only the immanentists, but also Cornelius who had disclosed the kernel of Avenarius' ideas! Thus, in the first place, Bogdanov *absolutely does not know* the "Machian philosophy" as a current which not only nestles under the wing of fideism, but which itself goes to the length of fideism. In the second place, Bogdanov *absolutely does not know* the history of philosophy; for to associate a denial of the ideas mentioned above with a denial of the thing-in-itself is to insult the history of philosophy. Will Bogdanov take it into his head to deny that all consistent followers of Hume, by rejecting every kind of thing-in-itself, *do leave room* for these ideas? Has Bogdanov never heard of the subjective idealists, who reject every kind of thing-in-itself and thereby make room for these ideas? "There can be no room" for these ideas *solely* in a philosophy that teaches that nothing exists but perceptual being, that the world is matter in motion, that the external world, the physical world familiar to all, is the sole objective reality, *i.e.,* in the philosophy of materialism. And it is for this, precisely for this, that materialism is being combated by the immanentists recommended by Mach, by Mach's disciple Cornelius, and by modern professorial philosophy in general.

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[1] Quoted from Bogdanov's introduction to the Russian translation of the *Analyse der Empfindungen.—Trans.*

Our Machians began to repudiate Cornelius only after this indecency had been pointed out to them. Such repudiations are not worth much. Friedrich Adler evidently has not been "warned," and therefore recommends this Cornelius in a socialist journal (*Der Kampf,* 1908, No. 5, p. 235: "a work that is easy to read and highly to be commended"). Through the medium of Machism, downright philosophical reactionaries and preachers of fideism are palmed off on the workers as teachers!

Petzoldt, without having been warned, detected the falsity in Cornelius: but his method of combating this falsity is a gem. Listen to this: "To assert that the world is idea [as is asserted by the idealists—whom we are combating, no joke!] has sense only when it implies that it is the idea of the predicator, or if you like, of all predicators, *i.e.,* that its existence depends exclusively upon the thought of that individual or of those individuals; it exists only inasmuch as he thinks about it, and what he does not think of does not exist. We, on the contrary, make the world dependent not upon the thought of an individual or individuals, or, to put it better and clearer, not upon the *act* of thinking, or upon any *actual* thought, but—and exclusively in the logical sense—upon thought in general. The idealist confuses one with the other, and the result is agnostic semi-solipsism, as we observe it in Cornelius" (*Einführung,* Bd. II, S. 317).

Stolypin[1] denied the existence of the *cabinets noirs*! Petzoldt annihilates the idealists. It is truly astonishing how much this annihilation of idealism resembles a recommendation to the idealists to exercise more skill in concealing their idealism. To say that the world depends upon man's thought is perverted idealism. To say that the world depends upon thought in general is recent positivism, critical realism—in a word, thoroughgoing bourgeois charlatanism! If Cornelius is an agnostic semi-solipsist, Petzoldt is a solipsist semi-agnostic. You are cracking a flea, gentlemen!

Let us proceed. In the second edition of his *Erkenntnis und Irrtum,* Mach says: "A systematic exposition [of Mach's views], one to which in all its essentials I can subscribe, is given by Professor Dr. Hans Kleinpeter" (*Die Erkenntnistheorie der Naturforschung der Gegenwart,* Leipzig 1905). Let us take Hans Number Two. This professor is an accredited disseminator of Machism: a pile of articles on Mach's views in philosophical journals, both in German and in English, translations of works recommended by Mach with introductions by Mach—in a word, the right hand of the "teacher." Here are his views: "... All my (outer and inner) experience, all my thoughts and aspirations are given me as a psychical process, as a part of my consciousness..." (*op. cit.,* p. 18). "That which we call physical is a construction of psychical elements..." (p. 144). *"Subjective conviction,*

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[1] P. A. Stolypin (1862-1911), Prime Minister and Minister of Home Affairs, notorious for the suppression of the revolution of 1905-07 and the period of brutal reaction that followed it.—*Trans.*

not objective certainty (Gewißheit) is the only attainable goal of any science..." (p. 9). (The italics are Kleinpeter's, who adds the following remark: "Something similar was already said by Kant in the *Critique of Practical Reason.*") "The assumption that there are other minds is one which can never be confirmed by experience..." (p. 42). "I do not know ... whether, in general, there exist other selves outside of myself" (p. 43). In Chapter II, § 5, entitled "Activity (Spontaneity) in Consciousness," we read that in the case of the animal-automaton the succession of ideas is purely mechanical. The same is true of us when we dream. "The quality of our consciousness in its normal state essentially differs from this. It possesses a property which these (the automata) entirely lack, and which it would be very difficult, to say the least, to explain mechanically or automatically: the so-called self-activity of the Self. Every person can dissever himself from his states of consciousness, he can manipulate them, can make them stand out more clearly or force them into the background, can analyse them, compare various parts, etc. All this is a fact of (immediate) experience, Our Self is therefore essentially different from the sum-total of the states of consciousness and cannot be put as an equivalent of it. Sugar consists of carbon, hydrogen and oxygen; were we to attribute a soul to it, then by analogy it would have to possess the faculty of directing the movement of the hydrogen, oxygen and carbon at will" (pp. 29-30). § 4 of the following chapter is headed: "The Act of Cognition—an Act of Will *(Willenshandlung).*" "It must be regarded as definitely established that all my psychical experiences are divisible into two large main groups: compulsory acts and deliberate acts. To the former belong all impressions of the external world ..." (p, 47). "That it is possible to advance several theories regarding one and the same realm of facts ... is as well known to physicists as it is incompatible with the premises of an absolute theory of knowledge. And this fact is also linked with the volitional character of our thought; it also implies that our volition is not bound by external circumstances" (p. 50).

Now judge how bold Bogdanov was in asserting that in Mach's philosophy "there is absolutely no room for free will," when Mach himself recommends such a specimen as Kleinpeter! We have already seen that the latter does not attempt to conceal either his own idealism or Mach's. In 1898-99 Kleinpeter wrote: "Hertz proclaims the same subjectivist view [*i.e.*, as Mach] of the nature of our concepts. . . . If Mach and Hertz [with what justice Kleinpeter here implicates the famous physicist we shall soon see] deserve credit from the standpoint of idealism for having emphasised the subjective origin of *all* our concepts and of the connections between them—and not only of certain individual ones—from the standpoint of empiricism they deserve no less credit for having acknowledged that experience alone, as a court entirely independent of thought, can solve the question as to their correctness" (*Archiv für systematische Philosophie,* Bd. V, 1898-99, S. 169-70). In 1900 he wrote that in spite of all the points on which Mach differs from Kant and Berkeley, "they at any rate are more akin to him than the metaphysical empiricism prevailing in natural science [*i.e.*, materialism! The professor does not like to call the devil by name] which is indeed the main target of Mach's attacks" (*op. cit.*, Bd. VI, S. 87). In 1903 he wrote: "The starting point of Berkeley and Mach is irrefutable . . . Mach completed what Kant began" (*Kantstudien,* Bd. VIII, 1903, S. 314, 274).

In the preface to the Russian edition of the *Analyse der Empfindungen,* Mach also mentions T. Ziehen, "who is following, if not the same, at least very close paths." We take Professor T. Ziehen's book (*Psychophysiologische Erkenntnistheorie,* Jena 1898) and find that the author refers to Mach, Avenarius, Schuppe, and so forth in the very introduction. Here therefore we again have a case of a disciple acknowledged by the teacher. The "recent" theory of Ziehen is that only the "mob" is capable of believing that "real objects evoke our sensations" (p. 3), and that "over the portals of the theory of knowledge there can be no other inscription than the words of Berkeley: 'The external objects subsist not by themselves, but exist in our minds!'" (p. 5).

"What is given us is sensations and ideas. Both are embraced by the word psychical. Non-psychical is a word devoid of meaning" (p. 100). The laws of nature are relations not of material bodies but of "reduced sensations" (p. 104. This "new" concept—"reduced sensations"—contains everything that is original in Ziehen's Berkeleianism!).

Petzoldt repudiated Ziehen as an idealist as far back as 1904 in the second volume of his *Einführung,* etc. (pp. 298-301). By 1906 he had already included Cornelius, Kleinpeter, Ziehen and Verworn (*Das Weltproblem,* S. 137, Fussnote) in the list of *idealists or psychomonists.* In the case of all these worthy professors, you see, there is a "misconception" in their interpretations "of the views of Mach and Avenarius" *(ibid.).*

Poor Mach and Avenarius! Not only were they slandered by their enemies for idealism and "even" (as Bogdanov expresses it) solipsism, but their very friends, disciples and followers, expert professors, also understood their teachers pervertedly, in an idealist sense. If empirio-criticism is developing into idealism, that by no means demonstrates the radical falsity of its muddled Berkeleian basic premises. God forbid! It is only a slight "misconception," in the Nozdriev-Petzoldt[1] sense of the term.

The funniest thing of all perhaps is that Petzoldt himself, the guardian of purity and innocence, firstly, "supplemented" Mach and Avenarius with his "logical *a priori"* and, secondly, coupled them with Wilhelm Schuppe, the vehicle of fideism.

Had Petzoldt been acquainted with Mach's English adherents he would have had very considerably to extend the list of Machians who had lapsed (because of a "misconception") into idealism. We have already referred to Karl Pearson, whom Mach praised, as an unadulterated idealist. Here are the opinions of two other "slanderers" who say the same thing of Pearson: "Professor Pearson is merely echoing a doctrine first given clear utterance by the truly great Berkeley" (Howard V. Knox, *Mind,* 1897, Vol. VI., p. 205). "There can be no doubt that Mr. Pearson is an idealist in the strictest sense of the word" (Georges Rodier, *Revue philosophique,* 1888, II, Vol. 26, p. 200). The English idealist, William Clifford, whom Mach regards as "coming very close" to his philosophy (*Analyse der Empfindungen,* S. 8), must be considered a teacher rather than a disciple of Mach, for Clifford's philosophical works appeared in the 'seventies. Here the "misconception" is due to Mach himself, who in 1901 "failed to notice" the idealism in Clifford's doctrine that the world is "mind-stuff," a "social object," a "highly organised experience," and so forth.[1] For a characterisation of the charlatanism of the German Machians, it is sufficient to note that Kleinpeter in 1905 elevated this idealist to the rank of founder of the "epistemology of modern science"!

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[1] Nozdriev, a character in Gogol's *Dead Souls.*—*Trans.*

On page 284 of the *Analyse der Empfindungen,* Mach mentions the "kindred" (to Buddhism and Machism) American philosopher, Paul Carus. Carus, who regards himself as an "admirer and personal friend" of Mach, edits in Chicago *The Monist,* a journal devoted to philosophy, and *The Open Court,* a journal devoted to the propagation of religion. "Science is divine revelation," say the editors of this popular little journal, and they express the opinion that science can bring about a reform of the church that will retain "all that is true and good in religion." Mach is a regular contributor to *The Monist* and publishes in it individual chapters from his latest works. Carus corrects Mach "ever so little" à la Kant, and declares that Mach "is an idealist or, as we would say, a subjectivist." "There are, no doubt, differences between Mach's views and mine," although "I at once recognised in him a kindred spirit."[1] "Our Monism," says Carus, "is not materialistic, not spiritualistic, not agnostic; it merely means consistency . . . it takes experience as its basis and employs as method the systematic forms of the relations of experience" (evidently a plagiarism from Bogdanov's *Empirio-Monism*!). Carus' motto is: "Not agnosticism, but positive science, not mysticism, but clear thinking, not super-naturalism, not materialism, but a monistic view of the world, not a dogma, but religion, not creed, but faith." And in conformity with this motto Carus preaches a "new theology," a "scientific theology," or theonomy, which denies the literalness of the bible but insists that "all truth is divine and God reveals himself in science as he does in history."[2] It should be remarked that Kleinpeter, in his book on the theory of knowledge of modern science already referred to, recommends Carus, together with Ostwald, Avenarius and the immanentists (pp. 151-52). When Haeckel issued his theses for a Monistic Alliance, Carus vigorously opposed him on the ground that, first, Haeckel vainly attempts to refute apriorism, which is "quite in keeping with scientific philosophy"; second, that Haeckel's doctrine of determinism "excludes the possibility of free will"; third, that Haeckel is mistaken "in emphasising the one-sided view of the naturalist against the traditional conservatism of the churches. Thus he appears as an enemy to the existing churches instead of rejoicing at their higher development into a new and truer interpretation of their dogmas . . ." (*ibid.*, Vol. XVI, 1906, pp. 121-22). Carus himself admits that "I appear reactionary to many freethinkers who blame me for not joining their chorus in denouncing all religion as superstition" (p. 355).

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[1] W. K. Clifford, *Lectures and Essays,* 3rd ed., London, 1901, Vol. II, pp. 55, 65, 69: "On this point I agree entirely with Berkeley and not with Mr. Spencer" (p. 58); "The object, then, is a set of changes in my consciousness, and not anything out of it" (p. 52).

It is quite evident that we have here a leader of a gang of American literary fakers who are engaged in doping the people with religious opium. Mach and Kleinpeter joined this gang evidently as the result of a slight "misconception."

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[1] *The Monist*, Chicago, Vol. XVI, July 1906, P. Carus, 'Professor Mach's Philosophy," pp. 320, 345, 333. The article is a reply to an article by Kleinpeter which appeared in the same journal.

[2] *Ibid.*, Vol. XIII, p. 24 *et seq.*, *Theology as a Science.*

5. A. BOGDANOV'S EMPIRIO-MONISM

"I personally," writes Bogdanov of himself, "know so far of only one empirio-monist in literature—a certain A. Bogdanov. But I know him very well and can answer for it that his views fully accord with the sacramental formula of the primacy of 'nature' over 'mind.' To wit, he regards all that exists as a continuous chain of development, the lower links of which are lost in the 'chaos of elements,' while the higher links, known to us, represent the *experience of men* [Bogdanov's italics]—psychical and, still higher, physical experience. This experience, and the knowledge resulting therefrom, correspond to what is usually called mind" (*Empirio-Monism,* Bk. III, p. xii).

The "sacramental" formula here ridiculed by Bogdanov is Engels' well-known proposition, which Bogdanov however diplomatically evades! We do not differ from Engels, oh, no!

But let us examine more carefully Bogdanov's own summary of this famous "empirio-monism" and "substitution." The physical world is called the *experience of men* and it is declared that physical experience is "higher" in the chain of development than psychical. But this is utter nonsense! And it is precisely the kind of nonsense that is characteristic of all idealist philosophies. It would be farcical to class this "system" of Bogdanov's as materialism. With me, too, he says, nature is primary and mind secondary. If Engels' definition is to be thus construed, then Hegel is also a materialist, for with him, too, psychical experience (under the title of the absolute idea) comes first, then follow, "higher up,"[1] the physical world, nature, and, lastly, human knowledge, which through nature apprehends the absolute idea. Not a single idealist will deny the primacy of nature taken in this sense, for it is not a genuine primacy, since in fact nature is not taken as the *immediately* given, as the starting point of epistemology. Nature is in fact reached as the result of a long process, *through abstraction* of the "psychical." It is immaterial what these abstractions are called: whether absolute idea, universal *self,* world will, and so on and so forth. These terms distinguish the different *varieties* of idealism, and such varieties exist in countless numbers. The essence of idealism is that the psychical is taken as the starting point; from it external nature is deduced, *and only then* is the ordinary human consciousness deduced from nature. Hence, this primary "psychical" always turns out to be a *lifeless abstraction* concealing a diluted theology. For instance, everybody knows what a human *idea* is; but an idea independent of man and prior to man, an idea in the abstract, an absolute idea, is a theological invention of the idealist Hegel. Everybody knows what human sensation is; but sensation independent of man, sensation prior to man, is nonsense, a lifeless abstraction, an idealist artifice. And it is precisely to such an idealistic artifice that Bogdanov resorts when he erects the following ladder.

1) The chaos of "elements" (we know that no other human concept lies back of the term "element" save *sensation*).

2) The psychical experience of men.

3) The physical experience of men.

4) "The knowledge emerging therefrom."

There are no sensations (human) without man. Hence, the first rung of this ladder is a lifeless idealist abstraction. As a matter of fact, what we have here is not the usual and familiar *human* sensations, but fictitious sensations, *nobody's* sensations, sensations *in general,* divine sensations—just as the ordinary human idea became divine with Hegel when it was divorced from man and man's brain.

So away with the first rung!

Away also with the second rung, for the *psychical before* the physical (and Bogdanov places the second rung *before* the third) is something unknown to man or science. The physical realm existed before the psychical could have appeared, for the latter is the highest product of the highest forms of organic matter. Bogdanov's second rung is also a lifeless abstraction, it is thought without brain, human reason divorced from man.

Only when we throw out the first two rungs, and only then, can we obtain a picture of the world that truly corresponds to science and materialism. To wit: 1) the physical world exists *independently* of the mind of man and existed long *prior to* man, *prior to* any "human experience"; 2) the psychical, the mind, etc., is the highest product of matter (*i.e.*, the physical), it is a function of that particularly complex fragment of matter called the human brain.

"The realm of substitution," writes Bogdanov, "coincides with the realm of physical phenomena; for the psychical phenomena we need substitute nothing, because they are immediate complexes" (p. xxxix).

And this precisely is idealism; for the psychical, *i.e.*, consciousness, idea, sensation, etc., is taken as the *immediate* and the physical is deduced from it, substituted for it. The world is the non-ego created by the ego, said Fichte. The world is absolute idea, said Hegel. The world is will, said Schopenhauer. The world is conception and idea, said the immanentist Rehmke. Being is consciousness, said the immanentist Schuppe. The physical is a substitution for the psychical, says Bogdanov. One must be blind not to perceive the identical idealist essence under these various verbal cloaks.

"Let us ask ourselves the following question," writes Bogdanov in Book I of *Empirio-Monism* (pp. 128-29): "What is a 'living being,' for instance, 'man'?" And he answers: "Man is primarily a definite complex of immediate experiences. [Mark, *"primarily"*!] *Then,* in the further development of experience, 'man' becomes both for himself and for others a physical body amidst other physical bodies."

Why, this is a sheer "complex" of absurdities, fit only for deducing the immortality of the soul, or the idea of God, and so forth. Man is primarily a complex of immediate experiences and in the course of *further development* becomes a physical body! That means that there are "immediate experiences" *without* a physical body, *prior* to a physical body! What a pity that this magnificent philosophy has not yet found acceptance in our theological seminaries! There its merits would have been fully appreciated.

"... We have admitted that 'physical nature' itself is a *product* [Bogdanov's italics] of complexes of an immediate character (to which 'psychical' co-ordinations also belong), that it is the reflection of such complexes in others, analogous to them, but of the most complex type (in the socially-organised experience of living beings)" (p. 146).

A philosophy which teaches that physical nature itself is a product, is a philosophy of the priests pure and simple. And its character is in no wise altered by the fact that personally Bogdanov emphatically repudiates all religion. Dühring was also an atheist; he even proposed to prohibit religion in his "socialitarian" order. Nevertheless, Engels was absolutely right in pointing out that Dühring's "system" could not make ends meet without religion. The same is true of Bogdanov, with the essential difference that the quoted passage is not a chance inconsistency but the very essence of his "empirio-monism" and of all his "substitution." If nature is a product, it is obvious that it can be a product only of something that is greater, richer, broader, mightier than nature, of something that exists; for in order to "produce" nature, it must exist independently of nature. That means that something exists *outside* nature, something which moreover *produces* nature. In plain language this is called God. The idealist philosophers have always sought to change this latter name, to make it more abstract, more vague and at the same time (for the sake of plausibility) to bring it nearer to the "psychical," as an "immediate complex," as the immediately given which requires no proof. Absolute idea, universal spirit, world will, *"general substitution"* of the psychical for the physical, are different formulations of one and the same idea. Every man knows, and science investigates, idea, spirit, will, the psychical, as a function of the normally operating human brain. To divorce this function from substance organised in a definite way, to convert this function into a universal, general abstraction, to "substitute" this abstraction for the whole of physical nature, this is the raving of philosophical idealism and a mockery of science.

Materialism says that the "socially-organised experience of living beings" is a product of physical nature, a result of a long development of the latter, a development from a state of physical nature when no society, organisation, experience, or living beings existed or could have existed. Idealism says that physical nature is a product of this experience of living beings, and in saying this, idealism is equating (if not subordinating) nature to God. For God is undoubtedly a product of the socially-organised experience of living beings. No matter from what angle you look at it, Bogdanov's philosophy contains nothing but a reactionary muddle.

Bogdanov thinks that to speak of the social organisation of experience is "cognitive socialism" (Bk. III, p. xxxiv). This is insane twaddle. If socialism is thus regarded, the Jesuits are ardent adherents of "cognitive socialism," for the basis of their epistemology is divinity as "socially-organised experience." And there can be no doubt that Catholicism is a socially-organised experience; only, it reflects not objective truth (which Bogdanov denies, but which science reflects), but the exploitation of the ignorance of the masses by definite social classes.

But why speak of the Jesuits! We find Bogdanov's "cognitive socialism" in its entirety among the immanentists, so beloved of Mach. Leclair regards nature as the consciousness of "mankind" (*Der Realismus,* S. 55), and not of the individual. The bourgeois philosophers will serve you up any amount of such Fichtean cognitive socialism. Schuppe also emphasises *das generische, das gattungsmäßige Moment des Bewußtseins* (*Vierteljahrsschrift für wissenschaftliche Philosophie,* Bd. XVII, S. 379-80), *i.e.,* the general, the generic factor of consciousness. To think that philosophical idealism vanishes by substituting the consciousness of mankind for the consciousness of the individual, or the socially-organised experience for the experience of one person, is like thinking that capitalism will vanish by replacing one capitalist by a joint stock company.

Our Russian Machians, Yushkevich and Valentinov, echo the materialist Rakhmetov in asserting that Bogdanov is an idealist (at the same time foully abusing Rakhmetov himself). But they could not stop to think where this idealism came from. They make out that Bogdanov is an individual and chance phenomenon, an isolated case. This is not true. Bogdanov personally may think that he has invented an "original" system, but one has only to compare him with the afore-mentioned disciples of Mach to realise the falsity of such an opinion. The difference between Bogdanov and Cornelius is far less than the difference between Cornelius and Carus. The difference between Bogdanov and Carus is less (as far as their philosophical systems are concerned, of course, and not the deliberateness of their reactionary implications) than the difference between Carus and Ziehen, and so on. Bogdanov is only one of the manifestations of that "socially-organised experience" which testifies to the growth of Machism into idealism. Bogdanov (we are here, of course, speaking *exclusively* of Bogdanov as a philosopher) could not have come into God's world had the doctrines of his teacher Mach contained no "elements" ... of Berkeleianism. And I cannot imagine a more "terrible vengeance" on Bogdanov than to have his *Empirio-Monism* translated, say, into German and presented for review to Leclair and Schubert-Soldern, Cornelius and Kleinpeter, Carus and Pillon (the French collaborator and disciple of Renouvier). The compliments that would be paid by these comrades-in-arms and, at times, direct followers of Mach to the "substitution" would be much more eloquent than their arguments.

However, it would scarcely be correct to regard Bogdanov's philosophy as a finished and static system. In the nine years from 1899 to 1908, Bogdanov has gone through four stages in his philosophical peregrinations. At the beginning he was a "natural-historical" materialist (*i.e.*, semi-consciously and instinctively faithful to the spirit of science). His *Fundamental Elements of the Historical Outlook on Nature* bears obvious traces of that stage. The second stage was the "energetics" of Ostwald, which was so fashionable in the latter 'nineties, a muddled agnosticism which at times stumbled into idealism. From Ostwald (the title page of Ostwald's *Vorlesungen über Naturphilosophie* bears the inscription: "Dedicated to E. Mach") Bogdanov went over to Mach, that is, he borrowed the fundamental premises of a subjective idealism that is as inconsistent and muddled as Mach's entire philosophy. The fourth stage is an attempt to eliminate some of the contradictions of Machism, and to create a semblance of objective idealism. "The theory of general substitution" shows that Bogdanov has described a curve of almost 180° from his starting position. Is this stage of Bogdanov's philosophy more remote or less remote from dialectical materialism than the previous stages? If Bogdanov remains in one place, then he is, of course, more remote. If he keeps moving along the same curve in which he has been moving for the last nine years, he is less remote. He now has *only* one serious step to make in order to return once more to materialism, namely, universally to discard his whole universal substitution. For this universal substitution gathers into one Chinese pigtail all the transgressions of half-hearted idealism and all the weaknesses of consistent subjective idealism, just as (*si licet parva componere magnis!*—if it is permissible to compare the great with the small) Hegel's "absolute idea" gathered together all the contradictions of Kantian idealism and all the weaknesses of Fichteanism. Feuerbach had to make *only* one serious step in order to return to materialism, namely, universally to discard, absolutely to eliminate, the absolute idea, that Hegelian "substitution of the psychical" for physical nature. Feuerbach cut off the Chinese pigtail of philosophical idealism, in other words, he took nature as the basis without any "substitution" whatever.

We must wait and see whether the Chinese pigtail of Machian idealism will go on growing for much longer.

6. THE "THEORY OF SYMBOLS" (OR HIEROGLYPHS) AND THE CRITICISM OF HELMHOLTZ

As a supplement to what has been said above of the idealists as the comrades-in-arms of and successors to empirio-criticism, it will be appropriate to dwell on the character of the Machian criticism of certain philosophical propositions touched upon in our literature. For instance, our Machian would-be Marxists fastened with glee on Plekhanov's "hieroglyphs," that is, on the theory that man's sensations and ideas are not copies of real things and processes of nature, not their images, but conventional signs, symbols, hieroglyphs, and so on. Bazarov ridicules this hieroglyphic materialism; and, it should be stated, *he would be right* in doing so if he rejected hieroglyphic materialism in favour of non-hieroglyphic *materialism*. But Bazarov here again resorts to a sleight-of-hand and palms off his renunciation of materialism as a criticism of "hieroglyphism." Engels speaks neither of symbols nor of hieroglyphs, but of copies, photographs, images, mirror-reflections of things. Instead of pointing out the erroneousness of Plekhanov's deviation from Engels' formulation of materialism, Bazarov uses Plekhanov's error in order to conceal Engels' truth from the reader.

To make clear both Plekhanov's error and Bazarov's confusion we shall refer to an important advocate of the "theory of symbols" (calling a symbol a hieroglyph changes nothing), Helmholtz, and shall see how he was criticised by the materialists and by the idealists in conjunction with the Machians.

Helmholtz, a scientist of the first magnitude, was as inconsistent in philosophy as are the great majority of scientists. He tended toward Kantianism, but in his epistemology he did not adhere even to these views consistently. Here for instance are some passages on the subject of the correspondence of ideas and objects from his *Handbuch der physiologischen Optik*: "I have... designated sensations as merely *symbols* for the relations of the external world and

I have denied that they have any similarity or equivalence to what they represent" (p. 442). This is agnosticism, but on the same page further on we read: "Our concepts and ideas are *effects* wrought on our nervous system and our consciousness by the objects that are conceived and apprehended." This is materialism. But Helmholtz is not clear as to the relation between absolute and relative truth, as is evident from his subsequent remarks. For instance, a little further on he says: "I therefore think that there can be no possible meaning in speaking of the truth of our ideas save as a *practical* truth. Our ideas of things *cannot be anything but* symbols, natural signs for things, which we learn to use in order to regulate our movements and actions. When we have learned to read these symbols rightly we are in a position with their aid to direct our actions so as to achieve the desired result. . . ." This is not correct. Helmholtz here lapses into subjectivism, into a denial of objective reality and objective truth. And he arrives at a flagrant untruth when he concludes the paragraph with the words: "An idea and the object it represents obviously belong to two entirely different worlds." Only the Kantians thus divorce idea from reality, consciousness from nature. However, a little further on we read: "As to the properties of the objects of the external world, a little reflection will show that all the properties we may attribute to them merely signify the *effects* wrought by them either on our senses or on other natural objects" (p. 445). Here again Helmholtz reverts to the materialist position. Helmholtz was an inconsistent Kantian, now recognising *a priori* laws of thought, now tending towards the "transcendental reality" of time and space (*i.e.*, to a materialist conception of them); now deriving human sensations from external objects, which act upon our sense-organs, and now declaring sensations to be only symbols, *i.e.*, certain arbitrary signs divorced from the "entirely different" world of the things signified (*cf.* Viktor Heyfelder, *Ueber den Begriff der Erfahrung bei Helmholtz,* Berlin 1897).

This is how Helmholtz expressed his views in a speech delivered in 1878 on "Facts in Perception" ("a noteworthy pronouncement from the realistic camp," as Leclair characterised this speech): "Our sensations are indeed effects wrought by external causes in our organs, and the manner in which such effects manifest themselves, of course, depends very essentially on the nature of the apparatus on which these effects are wrought. Inasmuch as the quality of our sensation informs us of the properties of the external action by which this sensation is produced, the latter can be regarded as its *sign (Zeichen),* but not as its *image.* For a certain resemblance to the object imaged is demanded of an image.... But a sign need not resemble that of which it is a sign..." (*Vorträge und Reden,* 1884, Bd. II, S. 226). If sensations are not images of things, but only signs or symbols, which do "not resemble" them, then Helmholtz's initial materialist premise is undermined; the existence of external objects becomes subject to doubt; for signs or symbols may quite possibly indicate imaginary objects, and everybody is familiar with instances of *such* signs or symbols. Helmholtz, following Kant, attempts to draw something like an absolute boundary between the "phenomenon" and the "thing-in-itself." Helmholtz harbours an insuperable prejudice against straightforward, clear, and open materialism. But a little further on he says: "I do not see how one could refute a system even of the most extreme subjective idealism that chose to regard life as a dream. One might declare it to be highly improbable and unsatisfactory—I myself would in this case subscribe to the severest expressions of dissent—yet it could be constructed consistently.... The *realistic hypothesis,* on the contrary, trusts the evidence *(Aussage)* of ordinary self-observation, according to which the changes of perception that follow a certain action have no psychical connection with the preceding impulse of volition. This hypothesis regards everything that seems to be substantiated by our everyday perception, *viz.,* the material world outside of us, as existing independently of our ideas." (Pp. 242-43.) "Undoubtedly, the realistic hypothesis is the simplest we can construct; it has been tested and verified in an extremely broad field of application; it is sharply defined in its several parts and, therefore, it is in the highest degree useful and fruitful as a basis of action" (p. 243). Helmholtz's agnosticism also resembles "shamefaced materialism," with certain Kantian twists, in distinction to Huxley's Berkeleian twists.

Albrecht Rau, a follower of Feuerbach, therefore vigorously criticises Helmholtz's theory of symbols as an inconsistent deviation from "realism." Helmholtz's basic view, says Rau, is a realistic hypothesis, according to which "we apprehend the objective properties of things with the help of our senses."[1] The theory of symbols cannot be reconciled with such a view (which, as we have seen, is wholly materialist), for it implies a certain distrust of perception, a distrust of the evidence of our sense-organs. It is beyond doubt that an image cannot wholly resemble the model, but an image is one thing, a symbol, a *conventional sign,* another. The image inevitably and of necessity implies the objective reality of that which it "images." "Conventional sign," symbol, hieroglyph are concepts which introduce an entirely unnecessary element of agnosticism. Albrecht Rau, therefore, is perfectly right in saying that Helmholtz's theory of symbols pays tribute to Kantianism. "Had Helmholtz," says Rau, "remained true to his realistic conception, had he consistently adhered to the basic principle that the properties of bodies express the relations of bodies to each other and also to us, he obviously would have had no need of the whole theory [of symbols]; he could then have said, briefly and clearly: the sensations which are produced in us by things are reflections of the nature of those things" (*ibid.,* p. 320).

That is the way a materialist criticises Helmholtz. He rejects Helmholtz's hieroglyphic or symbolic materialism or semi-materialism in the name of Feuerbach's consistent materialism.

The idealist Leclair (a representative of the "immanentist school," so dear to Mach's heart and mind) also accuses

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[1] Albrecht Rau, *Empfinden und Denken,* Gießen 1896, S. 304.

Helmholtz of inconsistency, of wavering between materialism and spiritualism. (*Der Realismus* etc., S. 154.) But for Leclair the theory of symbols is not insufficiently materialistic but too materialistic. Leclair says: "Helmholtz thinks that the perceptions of our consciousness offer sufficient support for the cognition of sequence in time as well as of the identity or non-identity of transcendental causes. This in Helmholtz's opinion is sufficient for the assumption and cognition of law in the realm of the transcendental" (*i.e.,* in the realm of the objectively real) (p. 33). And Leclair thunders against this "dogmatic prejudice of Helmholtz's": "Berkeley's God," he exclaims, "as the hypothetical cause of the conformity to *natural law* of the ideas in our mind is at least just as capable of satisfying our need of causality as a world of external objects..." (p. 34). "A consistent application of the theory of symbols ... can achieve nothing without a generous admixture of vulgar realism" (*i.e.,* materialism) (p. 35).

This is how a "critical idealist" criticised Helmholtz for his materialism in 1879. Twenty years later, in his article "The Fundamental Views of Ernst Mach and Heinrich Hertz on Physics,"[1] Kleinpeter, the disciple of Mach so highly praised by his teacher, refuted in the following way the "antiquated" Helmholtz with the aid of Mach's "recent" philosophy. Let us for the moment leave Hertz (who, in fact, was as inconsistent as Helmholtz) and examine Kleinpeter's comparison of Mach and Helmholtz. Having quoted a number of passages from the works of both writers, and having particularly stressed Mach's well-known statement to the effect that bodies are mental symbols for complexes of sensations and so on, Kleinpeter says:

"If we follow Helmholtz's line of thought, we shall encounter the following fundamental premises:

"1) There exist objects of the external world.

"2) A change in these objects is inconceivable without the action of some cause (which is thought of as real).

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[1] *Archiv für systematische Philosophie,* Bd. V, 1899, S. 163-64.

"3) 'Cause, according to the original meaning of the word, is the unchangeable residue or being behind the changing phenomena, namely, substance and the law of its action, force.' [The quotation is taken by Kleinpeter from Helmholtz.]

"4) It is possible to deduce all phenomena from their causes in a logically strict and uniquely determined manner.

"5) The achievement of this end is equivalent to the possession of objective truth, the acquisition *(Erlangung)* of which is thus regarded as conceivable" (p. 163).

Rendered indignant by these premises, by their contradictoriness and their creation of insoluble problems, Kleinpeter remarks that Helmholtz does not hold strictly to these views and sometimes employs "turns of speech which are somewhat suggestive of Mach's purely logical understanding of such words" as matter, force, causality, etc.

"It is not difficult to find the source of our dissatisfaction with Helmholtz, if we recall Mach's fine, clear words. The false understanding of the words mass, force, etc., is the basic weakness of Helmholtz's whole argument. These are only concepts, products of our imagination (and not realities existing outside of thought). We are not even in a position to know such things. From the observation of our senses we are in general unable, owing to their imperfection, to make a single uniquely determined conclusion. We can never assert, for instance, that upon reading a certain scale *(durch Ablesen einer Skala)* we shall obtain a definite figure: there are always, within certain limits, an infinite number of possible figures all equally compatible with the facts of the observation. And to have knowledge of something real lying outside us—that is for us impossible. Let us assume however that it were possible, and that we did get to know reality; in that case we would have no right to apply the laws of logic to it, for they are *our,* laws, applicable only to *our* conceptions, to *our* mental products [Kleinpeter's italics]. Between facts there is no logical connection, but only a simple succession; apodictic assertions are here unthinkable. It is therefore incorrect to say that one fact is the cause of another and, consequently, the whole deduction built up by Helmholtz on this conception falls to the ground. Finally, the attainment of objective truth, *i.e.*, truth existing independently of any subject, is impossible, not only because of the nature of our senses, but also because as men *(als Menschen)* we can in general have no notion of what exists quite independently of us" (p. 164).

As the reader sees, our disciple of Mach, repeating the favourite phrases of his teacher and of Bogdanov, who does not own himself a Machian, rejects Helmholtz's whole philosophy, rejects it from the idealist standpoint. The theory of symbols is not even especially singled out by the idealist, who regards it as an unimportant and perhaps accidental deviation from materialism. And Helmholtz is chosen by Kleinpeter as a representative of the "traditional views in physics," "views shared by the majority of physicists" (p. 160).

The result we have arrived at is that Plekhanov was guilty of an obvious mistake in his exposition of materialism, but that Bazarov completely muddled the matter, mixed up materialism with idealism and advanced in opposition to the "theory of symbols," or "hieroglyphic materialism," the idealist nonsense that "sense-perception is the reality existing outside us." From the Kantian Helmholtz, just as from Kant himself, the materialists went to the Left, the Machians to the Right.

7. TWO KINDS OF CRITICISM OF DÜHRING

Let us note another characteristic feature in the Machians' incredible perversion of materialism. Valentinov endeavours to beat the Marxists by comparing them to Büchner, who supposedly has much in common with Plekhanov, although Engels sharply dissociated himself from Büchner. Bogdanov, on the other hand, approaching the same question from another angle, defends, as it were, the "materialism of the natural scientists," which, he says, "is usually spoken of with a certain contempt" (*Empirio-Mon-*

ism, Bk. III, p. x). Both Valentinov and Bogdanov are wretchedly muddled on this question. Marx and Engels always "spoke contemptuously" of bad socialists; but from this it follows that they demanded the teaching of correct socialism, scientific socialism, and not a flight from socialism to bourgeois views. Marx and Engels always condemned *bad* (and, particularly, anti-dialectical) materialism; but they condemned it from the standpoint of a higher, more advanced, dialectical *materialism,* and not from the standpoint of Humism or Berkeleianism. Marx, Engels and Dietzgen would discuss the bad materialists, reason with them and seek to correct their errors. But they would not even discuss the Humeans and Berkeleians, Mach and Avenarius, confining themselves to a single still more contemptuous remark about their trend *as a whole.* Therefore, the endless faces and grimaces made by our Machians over Holbach and Co., Büchner and Co., etc., are absolutely nothing but an attempt to throw dust in the eyes of the public, a cover for the retreat of Machism as a whole from the very foundations of materialism in general, and a fear to take up a straightforward and clear position with regard to Engels.

And it would be hard to express oneself more clearly on the French materialism of the eighteenth century and on Büchner, Vogt and Moleschott, than Engels does at the end of Chapter II of his *Ludwig Feuerbach.* It is *impossible* not to understand Engels, unless one deliberately *wishes* to distort him. Marx and I are materialists—says Engels in this chapter, explaining what *fundamentally* distinguishes all schools of materialism *from the whole camp* of the idealists, from all the Kantians and Humeans in general. And Engels *reproaches Feuerbach for a certain pusillanimity,* a certain frivolity of thought, as expressed in his rejection at times of materialism in general because of the mistakes of one or another school of materialists. Feuerbach "should not have confounded the doctrines of these hedge-preachers [Büchner and Co.] with materialism in general," says Engels (*op. cit.,* p. 38). Only minds that are spoilt by reading and that credulously accept the doctrines of the German reactionary professors could have *misunderstood* the nature of *such* reproaches levelled by Engels at Feuerbach.

Engels says very clearly that Büchner and Co. "by no means overcame the limitations of their teachers," *i.e.,* the materialists of the eighteenth century, that they had not made a single *step forward.* And it is for this, and *this alone,* that Engels took Büchner and Co. to task; not for their materialism, as the ignoramuses think, but because they did not *advance* materialism; *"and, in truth, it was quite outside their scope to develop the theory* [of materialism] *any further."* It was for *this alone* that Engels took Büchner and Co. to task. And thereupon *point by point* Engels enumerates *three* fundamental "limitations" *(Beschränktheit)* of the French materialists of the eighteenth century, from which Marx and Engels had emancipated themselves, but from which Büchner and Co. were unable to emancipate themselves. The first limitation was that the views of the old materialists were "mechanical," *in the sense* that they believed in "the exclusive application of the standards of mechanics to processes of a chemical and organic nature" (p. 37). We shall see in the next chapter that failure to understand these words of Engels' caused certain people to succumb to idealism through the new physics. Engels does not reject *mechanical* materialism on the grounds attributed to him by physicists of the "recent" idealist (alias Machian) trend. The second limitation was the metaphysical character of the views of the old materialists, meaning the *"anti-dialectical character of their philosophy."* This limitation is fully shared with Büchner and Co. by our Machians, who, as we have seen, entirely failed to understand Engels' application of dialectics to epistemology (for example, absolute and relative truth). The third limitation was the preservation of idealism "up above," in the realm of the social sciences, a non-understanding of historical materialism.

Having enumerated these three "limitations" and explained them with exhaustive clarity, Engels *then and there* adds that they (Büchner and Co.) had not overcome these limitations *(über diese Schranken kamen).*

Exclusively for these three things and *exclusively* within these limits, does Engels refute both the materialism of the eighteenth century and the doctrines of Büchner and Co.! On all other, more elementary, questions of materialism (questions distorted by the Machians) *there is and can be no difference* between Marx and Engels on the one hand and all these old materialists on the other. It was only the Russian Machians who brought confusion into this perfectly clear question, since for their West-European teachers and co-thinkers the radical difference between the position of Mach and his friends and the position of the materialists generally is perfectly obvious. Our Machians found it necessary to confuse the issue in order to represent their break with Marxism and their desertion to the camp of bourgeois philosophy as "minor corrections" of Marxism!

Take Dühring. It is hard to imagine anything more contemptuous than the opinion of him expressed by Engels. But *at the same time that Dühring was criticised by Engels, just see how he was criticised by Leclair,* who praises Mach's "revolutionary philosophy." Leclair regards Dühring as the *"extreme Left"* of materialism, which "without any evasion declares sensation, as well as every activity of consciousness and intelligence in general, to be the secretion, function, supreme flower, aggregate effect, etc., of the animal organism" (*Der Realismus* etc., 1879, S. 23-24).

Is it for this that Engels criticised Dühring? No. In this he was in *full agreement* with Dühring, as he was with every other materialist. He criticised Dühring from the diametrically opposite standpoint, namely, for the inconsistency of his materialism, for his idealist fancies, which left a loophole for fideism.

"Nature itself works both within ideating beings and from without, in order to create the required knowledge of the course of things by systematically producing coherent views." Leclair quotes these words of Dühring's and savagely attacks the materialism of such a point of view, the "crude metaphysics" of this materialism, the "self-deception," etc., etc. (pp. 160-63).

Is it for this that Engels criticised Dühring? No. He ridiculed all florid language, but as regards the recognition of objective law in nature, reflected by the consciousness, *Engels was fully in agreement with Dühring,* as he was with every other materialist.

"Thought is a form of reality higher than the rest.... A fundamental premise is the independence and distinction of the materially real world from the groups of manifestations taken by the consciousness." Leclair quotes these words of Dühring's together with a number of Dühring's attacks on Kant, etc., and for this accuses Dühring of "metaphysics" (pp. 218-22), of subscribing to a "metaphysical dogma," etc.

Is it for this that Engels criticised Dühring? No. That the world exists independently of the mind and that every deviation from this truth on the part of the Kantians, Humeans, Berkeleians, and so forth, is false, on this point Engels was fully in agreement with Dühring, as he was with every other materialist. Had Engels seen *from what angle* Leclair, in the spirit of Mach, criticised Dühring, he would have called both these philosophical reactionaries names *a hundred times* more contemptuous than those he called Dühring. To Leclair Dühring was the incarnation of pernicious realism and materialism (*cf.* also *Beiträge zu einer monistischen Erkenntnistheorie,* 1882, S. 45). In 1878, W. Schuppe, teacher and comrade-in-arms of Mach, accused Dühring of "visionary realism" *(Traumrealismus)*[1] in revenge for the epithet "visionary idealism" which Dühring had hurled against all idealists. For Engels, *on the contrary,* Dühring was *not a sufficiently* steadfast, clear and consistent materialist.

Marx and Engels, as well as J. Dietzgen entered the philosophical arena at a time when materialism reigned among the advanced intellectuals in general, and in working class circles in particular. It is therefore quite natural that they should have devoted their attention not to a repetition of old ideas but to a serious theoretical *development* of materialism, its application to history, in other words, to the *completion* of the edifice of materialist philosophy *up to its summit*. It is quite natural that in the sphere of epistemology they *confined* themselves to correcting Feuerbach's errors, to ridiculing the banalities of the materialist Dühring, to criticising the errors of Büchner (see J. Dietzgen), to emphasising what these most widely known and popular writers among the workers *particularly* lacked, namely, dialectics. Marx, Engels and J. Dietzgen did not worry about the elementary truths of materialism, which had been cried by the hucksters in dozens of books, but devoted all their attention to ensuring that these elementary truths should not be vulgarised, should not be over-simplified, should not lead to stagnation of thought ("materialism below, idealism above"), to forgetfulness of the *valuable* fruit of the idealist systems, Hegelian dialectics—that pearl which those farmyard cocks, the Büchners, the Dührings and Co. (as well as Leclair, Mach, Avenarius and so forth), could not pick out from the dungheap of absolute idealism.

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[1] Dr. Wilhelm Schuppe, *Erkenntnistheoretische Logik,* Bonn, 1878, S. 56.

If one envisages at all concretely the historical conditions in which the philosophical works of Engels and J. Dietzgen were written, it will be perfectly clear why they were *more concerned to dissociate* themselves from the vulgarisation of the elementary truths of materialism than to *defend* the truths themselves. Marx and Engels were similarly more concerned to dissociate themselves from the vulgarisation of the fundamental demands of political democracy than to defend these demands.

Only disciples of the philosophical reactionaries could have "failed to notice" this circumstance, and could have presented the case to their readers in such a way as to make it appear that Marx and Engels did not know what being a materialist means.

8. HOW COULD J. DIETZGEN HAVE FOUND FAVOUR WITH THE REACTIONARY PHILOSOPHERS?

The previously cited example of Helfond already contains the answer to this question, and we shall not examine the innumerable instances in which J. Dietzgen receives Helfond-like treatment at the hands of our Machians. It is more expedient to quote a number of passages from J. Dietzgen himself in order to bring out his weak points.

"Thought is a function of the brain," says Dietzgen (*Das Wesen der menschlichen Kopfarbeit,* 1903). "Thought is a product of the brain.... My desk, as the content of my thought, is identical with that thought, does not differ from it. But my desk outside of my head is a separate object quite distinct from it" (pp. 52-53). These perfectly clear materialistic propositions are, however, supplemented by Dietzgen thus: "Nevertheless, the non-sensible idea is also sensible, material, *i.e.,* real.... The mind differs no more from the table, light, or sound than these things differ from each other" (p. 54). This is obviously false. That both thought and matter are "real," *i.e.,* exist, is true. But to say that thought is material is to make a false step, a step towards confusing materialism and idealism. As a matter of fact this is only an inexact expression of Dietzgen's, who elsewhere correctly says: "Mind and matter at least have this in common, that they exist" (p. 80). "Thinking," says Dietzgen, "is a work of the body.... In order to think I require a substance that can be thought of. This substance is provided in the phenomena of nature and life.... Matter is the boundary of the mind, beyond which the latter cannot pass.... Mind is a product of matter, but matter is more than a product of mind..." (p. 64). The Machians refrain from analysing materialist arguments of the materialist Dietzgen such as these! They prefer to fasten on passages where he is inexact and muddled. For example, he says that scientists can be "idealists only outside their field" (p. 108). Whether this is so, and why it is so, on this the Machians are silent. But a page or so earlier Dietzgen recognises the "positive side of modern idealism" (p. 106) and the "inadequacy of the materialist principle," which should rejoice the Machians. The incorrectly expressed thought of Dietzgen's consists in the fact that the difference between matter and mind is also *relative and not excessive* (p. 107). This is true, but what follows from this is not that materialism as such is inadequate, but that metaphysical, anti-dialectical materialism is inadequate.

"Simple, scientific truth is not based on a person. It has its foundation outside [*i.e.,* of the person], in its material; it is objective truth.... We call ourselves materialists.... Philosophical materialists are distinguished by the fact that they put the corporeal world at the beginning, at the head, and put the idea, or spirit, as the sequel, whereas their opponents, after the manner of religion, derive things from the word ... the material world from the idea" (*Kleinere philosophische Schriften,* 1903, S. 59, 62). The Machians avoid this recognition of objective truth and repetition of *Engels'* definition of materialism. But Dietzgen goes on to say: "We would be equally right in calling ourselves idealists, for our system is based on the total result of philosophy, on the scientific investigation of the idea, on a clear insight into the nature of mind" (p. 63). It is not difficult to seize upon this obviously incorrect phrase in order to deny materialism. Actually, Dietzgen's formulation is more inexact than his basic thought, which amounts to this, that the old materialism was unable to investigate ideas scientifically (with the aid of historical materialism).

Here are Dietzgen's ideas on the old materialism. "Like our understanding of political economy, our materialism is a scientific, historical conquest. Just as definitely as we distinguish ourselves from the socialists of the past, so we distinguish ourselves from the old materialists. With the latter we have only this in common, that we acknowledge matter to be the premise, or prime base of the idea" (p. 140). This word "only" is characteristic! It contains the *whole* epistemological foundation of materialism, *as distinguished from* agnosticism, Machism, idealism. But Dietzgen's attention is here concentrated on dissociating himself from vulgar materialism.

But then follows a little further on a passage that is quite incorrect: "The concept matter must be broadened. It embraces all the phenomena of reality, as well as our faculty of knowing or explaining" (p. 141). This is a muddle which can only lead to confusing materialism and idealism under the guise of "broadening" the former. To seize upon this "broadening" would be to forget the *basis* of Dietzgen's philosophy, the recognition of matter as the primary, "the boundary of the mind." But, as a matter of fact, a few lines further down Dietzgen corrects himself: "The whole governs the part, matter the mind.... In this sense we may love and honour the material world ... as the first cause, as the creator of heaven and earth" (p. 142). That the conception of "matter" must also include "thoughts," as Dietzgen repeats in the *Excursions* (*Kleinere philosophische Schriften*, p. 214), is a muddle, for if such an inclusion is made, the epistemological contrast between mind and matter, idealism and materialism, a contrast upon which Dietzgen himself insists, loses all meaning. That this contrast must not be made "excessive," exaggerated, metaphysical, is beyond dispute (and it is to the great credit of the *dialectical* materialist Dietzgen that he emphasised this). The limits of the absolute necessity and absolute truth of this relative contrast are precisely those limits which define the *trend* of epistemological investigations. To operate beyond these limits with the distinction between matter and mind, physical and psychical, as though they were absolute opposites, would be a great mistake.

Dietzgen, unlike Engels, expresses his thoughts in a vague, unclear, mushy way. But apart from his defects of exposition and his individual mistakes, he not unsuccessfully champions the *"materialist theory of knowledge"* (pp. 222 and 271) and *"dialectical materialism"* (p. 224). "The materialist theory of knowledge then," says Dietzgen, "amounts to the recognition that the human organ of perception radiates no metaphysical light, but is a piece of nature which reflects other pieces of nature" (pp. 222-23). "Our perceptive faculty is not a supernatural source of truth, but a mirror-like instrument, which reflects the things of the world, or nature" (p. 243). Our profound Machians avoid an analysis of each individual proposition of Dietzgen's *materialist theory of knowledge,* but seize upon his *deviations* from that theory, upon his vagueness and confusion. J. Dietzgen could find favour with the reactionary philosophers only because he occasionally gets muddled. And, it goes without saying, where there is a muddle there you will find Machians.

Marx wrote to Kugelmann on December 5, 1868: "A fairly long time ago he [Dietzgen] sent me a fragment of a manuscript on the 'faculty of thought' which in spite of a certain confusion and of too frequent repetition, contains much that is excellent and—as the independent product of a working man—admirable."[1] Mr. Valentinov quotes this opinion, but *it never dawned on him* to ask *what* Marx regarded as Dietzgen's *confusion,* whether it was that which brings Dietzgen close to Mach, or that which distinguishes Dietzgen from Mach. Mr. Valentinov does not ask this question because he read both Dietzgen and Marx's letters after the manner of Gogol's Petrushka. Yet it is not difficult to find the answer to this question. Marx frequently called his world outlook dialectical materialism, and Engels' *Anti-Dühring, the whole of which Marx read through in manuscript,* expounds precisely this world outlook. Hence, it should have been clear even to the Valentinovs that Dietzgen's *confusion* could lie only in his *deviation* from a consistent application of dialectics, from consistent *materialism,* in particular from *Anti-Dühring.*

Does it now dawn upon Mr. Valentinov and his brethren that what Marx could call Dietzgen's confusion is *only what brings Dietzgen close to Mach,* who went from Kant not towards materialism, but towards Berkeley and Hume? Or was it that the materialist Marx called Dietzgen's materialist theory of knowledge confused, yet approved his deviations from materialism, that is, approved what differs from *Anti-Dühring,* which was written with his [Marx's] participation?

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[1] Karl Marx, *Letters to Dr. Kugelmann,* English ed., 1934, p. 80.—*Trans.*

Whom are they trying to fool, our Machians, who desire to be regarded as Marxists and at the same time inform the world that "*their*" Mach approved of Dietzgen? Have our heroes failed to guess that Mach could approve in Dietzgen only that which Marx called confusion?

But taken as a whole, J. Dietzgen does not deserve so severe a censure. He is nine-tenths a materialist and never made any claims either to originality or to possessing a special philosophy distinct from materialism. He spoke of Marx frequently, and invariably as the *head of the movement* (*Kleinere philosophische Schriften,* S. 4—an opinion uttered in 1873; on page 95—1876—he emphasises that Marx and Engels "possessed the necessary philosophical training"; on page 181—1886—he speaks of Marx and Engels as the "acknowledged founders" of the movement). Dietzgen was a Marxist, and his son, Eugene Dietzgen, and—alas!—Comrade P. Dauge are rendering him left-handed service by their invention of "Naturmonismus," "Dietzgenism," etc. "Dietzgenism" as distinct from dialectical materialism is *confusion,* a *step* towards reactionary philosophy, an attempt to create a trend not from what is great in Joseph Dietzgen (and in that worker-philosopher, who discovered dialectical materialism in his own way, there is much that is great!) but *from his weak points.*

I shall confine myself to two examples in order to illustrate how Comrade P. Dauge and Eugene Dietzgen are sliding into reactionary philosophy.

In the second edition of the *Akquisit*[1] (p. 273) Dauge writes: "Even bourgeois criticism ... points out the connection between Dietzgen's philosophy and empirio-criticism and also the immanentist school [and below] ... especially Leclair" (a quotation from a "bourgeois criticism").

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[1] The reference is to an afterword to the 2nd Russian edition of the *Akquisit der Philosophie* written by P. Dauge and entitled "Joseph Dietzgen and His Critic, G. Plekhanov."—*Trans.*

That P. Dauge values and esteems J. Dietzgen cannot be doubted. But it also cannot be doubted that he is *defaming* him by citing *without protest* the opinion of a bourgeois scribbler who classes the sworn enemy of fideism and of the professors—the "graduated flunkeys" of the bourgeoisie—with the direct preacher of fideism and avowed reactionary, Leclair. It is possible that Dauge repeated another's opinion of the immanentists and of Leclair without himself being familiar with the writings of these reactionaries. But let this serve him as a warning: the road *away from* Marx to the peculiarities of Dietzgen—to Mach—to the immanentists—is a road leading into a morass. To class him not only with Leclair but even with Mach is to lay stress on Dietzgen the muddlehead as distinct from Dietzgen the materialist.

I shall defend Dietzgen against Dauge. I assert that Dietzgen did not deserve the shame of being classed with Leclair. And I can cite a witness, a most authoritative one on such a question, one who is as much a reactionary philosopher, fideist and "immanentist" as Leclair himself, namely, Schubert-Soldern. In 1896 he wrote: "The Social-Democrats willingly lean for support on Hegel with more or less (usually less) justification, but they materialise the Hegelian philosophy; *cf.* J. Dietzgen.... With Dietzgen, the absolute becomes the universal, and this becomes the thing-in-itself, the absolute subject, whose appearances are its predicates. That he [Dietzgen] is thus converting a pure abstraction into the basis of the concrete process, he does not, of course, realise any more than Hegel himself did.... He frequently chaotically lumps together Hegel, Darwin, Haeckel, and natural-scientific materialism" (*Die soziale Frage,* S. xxxiii). Schubert-Soldern is a keener judge of philosophical shades than Mach, who praises everybody indiscriminately, including the Kantian Jerusalem.

Eugene Dietzgen was so simple-minded as to complain to the German public that in Russia the narrow materialists had "insulted" Joseph Dietzgen, and he *translated* Plekhanov's and Dauge's articles on Joseph Dietzgen into German. (See Joseph Dietzgen, *Erkenntnis und Wahrheit,* Stuttgart 1908, Appendix.) The poor "Naturmonist's" complaint rebounded on his own head. Franz Mehring, who may be regarded as knowing something of philosophy and Marxism, wrote in his review that *Plekhanov was essentially right as against Dauge* (*Die Neue Zeit,* 1908, No. 38, 19. Juni, Feuilleton, S. 432). That J. Dietzgen *got into difficulties* when he *deviated* from Marx and Engels (p. 431) is for Mehring beyond question. Eugene Dietzgen replied to Mehring in a long, snivelling note, in which he went so far as to say that J. Dietzgen might be of service "in reconciling" the "warring brothers, the orthodox and the revisionists" (*Die Neue Zeit,* 1908, No. 44, 31. Juli, S. 652).

Another warning, Comrade Dauge: the road away from Marx to "Dietzgenism" and "Machism" is a *road into the morass,* not for individuals, not for Tom, Dick and Harry, but for the movement.

And do not complain, Messrs. Machians, that I quote the "authorities"; your objections to the authorities are but a screen for the fact that for the socialist authorities (Marx, Engels, Lafargue, Mehring, Kautsky) you are substituting bourgeois *authorities* (Mach, Petzoldt, Avenarius and the immanentists). You would do better not to raise the question of "authorities" and "authoritarianism"!

CHAPTER FIVE

THE RECENT REVOLUTION IN NATURAL SCIENCE AND PHILOSOPHICAL IDEALISM

A year ago, in *Die Neue Zeit* (1907, No. 52), there appeared an article by Joseph Diner-Dénes entitled "Marxism and the Recent Revolution in the Natural Sciences." The defect of this article is that it ignores the epistemological conclusions which are being drawn from the "new" physics and in which we are especially interested at present. But it is precisely this defect which renders the point of view and the conclusions of the author particularly interesting for us. Joseph Diner-Dénes, like the present writer, holds the view of the "rank-and-file Marxist," of whom our Machians speak with such haughty contempt. For instance, Mr. Yushkevich writes that "ordinarily, the average rank-and-file Marxist calls himself a dialectical materialist" (p. 1 of his book). And now this rank-and-file Marxist, in the person of J. Diner-Dénes, has *directly* compared the recent discoveries in science, and especially in physics (X-rays, Becquerel rays, radium, etc.), with Engels' *Anti-Dühring*. To what conclusion has this comparison led him? "In the most varied fields of natural science," writes Diner-Dénes, "new knowledge has been acquired, all of which tends towards that single point which Engels desired to make clear, namely, that in nature 'there are no irreconcilable contradictions, no forcibly fixed boundary lines and distinctions,' and that if contradictions and distinctions are met with in nature, it is because we alone have introduced their rigidity and absoluteness into nature." It was discovered, for instance, that light and electricity are only manifestations of one and the same force of nature. Each day it becomes more probable that chemical affinity may be reduced to electrical processes. The indestructible and non-disintegrable elements of chemistry, whose number continues to grow as though in derision of the unity of the world, now prove to be destructible and disintegrable. The element radium has been converted into the element helium. "Just as all the forces of nature have been reduced to one force, so, with this knowledge, all substances in nature have been reduced to *one substance*" (Diner-Dénes' italics). Quoting the opinion of one of the writers who regard the atom as a condensation of the ether, the author exclaims: "How brilliantly does this confirm the statement made by Engels thirty years ago that motion is the mode of existence of matter.... All phenomena of nature are motion, and the differences between them lie only in the fact that we human beings perceive this motion in different forms.... It is as Engels said. Nature, like history, is subject to the dialectical law of motion."

On the other hand, you cannot take up any of the writings of the Machians or about Machism without encountering pretentious references to the new physics, which is said to have refuted materialism, and so on and so forth. Whether these assertions are well-founded is another question, but the connection between the new physics, or rather a definite school of the new physics, and Machism and other varieties of modern idealist philosophy is beyond doubt. To analyse Machism and at the same time to ignore this connection—as Plekhanov does—is to scoff at the spirit of dialectical materialism, *i.e.*, to sacrifice the method of Engels to the letter of Engels. Engels says explicitly that "with each epoch-making discovery even in the sphere of natural science ["not to speak of the history of mankind"], it [materialism] has to change its form" (*Ludwig Feuerbach*, p. 36). Hence, a revision of the "form" of Engels' materialism, a revision of his natural-philosophical propositions is not only not "revisionism," in the accepted meaning of the term, but, on the contrary, is demanded by Marxism. We criticise the Machians not for making such a revision, but for their *purely* *revisionist* method of changing the *essence* of materialism under the guise of criticising its *form* and of adopting the fundamental precepts of reactionary bourgeois philosophy without making the slightest attempt to deal directly, frankly and definitely with assertions of Engels' which are unquestionably extremely important to the given question, as, for example, his assertion that "...motion without matter is unthinkable" (*Anti-Dühring,* p. 70).

It goes without saying that in examining the connection between one of the schools of modern physicists and the rebirth of philosophical idealism, it is far from being our intention to deal with special physical theories. What interests us exclusively is the epistemological conclusions that follow from certain definite propositions and generally known discoveries. These epistemological conclusions are of themselves so insistent that many physicists are already reaching for them. What is more, there are already various trends among the physicists, and definite schools are beginning to be formed on this basis. Our object, therefore, will be confined to explaining clearly the essence of the difference between these various trends and the relation in which they stand to the fundamental lines of philosophy.

1. THE CRISIS IN MODERN PHYSICS

In his book *Valeur de la science,* the famous French physicist Henri Poincaré says that there are "symptoms of a serious crisis" in physics, and he devotes a special chapter to this crisis (Chap. VIII, *cf.* also p. 171). The crisis is not confined to the fact that "radium, the great revolutionary," is undermining the principle of the conservation of energy. "All the other principles are equally endangered" (p. 180). For instance, Lavoisier's principle, or the principle of the conservation of mass, has been undermined by the electron theory of matter. According to this theory atoms are composed of very minute particles called electrons, which are charged with positive or negative electricity and "are immersed in a medium which we call the ether." The experiments of physicists provide data for calculating the velocity of the electrons and their mass (or the relation of their mass to their electrical charge). The velocity proves to be comparable with the velocity of light (300,000 kilometres per second), attaining, for instance, one-third of the latter. Under such circumstances the twofold mass of the electron has to be taken into account, corresponding to the necessity of overcoming the inertia, firstly, of the electron itself and, secondly, of the ether. The former mass will be the real or mechanical mass of the electron, the latter the "electrodynamic mass which represents the inertia of the ether." And it turns out that the former mass is equal to zero. The entire mass of the electrons, or, at least, of the negative electrons, proves to be totally and exclusively electrodynamic in its origin. Mass disappears. The foundations of mechanics are undermined. Newton's principle, the equality of action and reaction, is undermined, and so on.

We are faced, says Poincaré, with the "ruins" of the old principles of physics, "a debacle of principles." It is true, he remarks, that all the mentioned departures from principles refer to infinitesimal magnitudes; it is possible that we are still ignorant of other infinitesimals counteracting the undermining of the old principles. Moreover, radium is very rare. But at any rate we have reached a *"period of doubt."* We have already seen what epistemological deductions the author draws from this "period of doubt": "it is not nature which imposes on [or dictates to] us the concepts of space and time, but we who impose them on nature"; "whatever is not thought, is pure nothing." These deductions are idealist deductions. The breakdown of the most fundamental principles shows (such is Poincaré's trend of thought) that these principles are not copies, photographs of nature, not images of something external in relation to man's consciousness, but products of his consciousness. Poincaré does not develop these deductions consistently, nor is he essentially interested in the philosophical aspect of the question. It is dealt with in detail by the French writer on philosophical problems, Abel Rey, in his book *La théorie physique chez* *les physiciens contemporains,* Paris, 1907. True, the author himself is a positivist, *i.e.,* a muddlehead and a semi-Machian, but in this case this is even a certain advantage, for he cannot be suspected of a desire to slander our Machians' idol. Rey cannot be trusted when it comes to giving an exact definition of philosophical concepts and of materialism in particular, for Rey too is a professor, and as such is imbued with an utter contempt for the materialists (and distinguishes himself by utter ignorance of the epistemology of materialism). It goes without saying that a Marx or an Engels is absolutely non-existent for such "men of science." But Rey summarises carefully and in general conscientiously the extremely abundant literature on the subject, not only French, but English and German as well (Ostwald and Mach in particular), so that we shall have frequent recourse to his work.

The attention of philosophers in general, says the author, and also of those who, for one reason or another, wish to criticise science generally, has now been particularly attracted towards physics. "In discussing the limits and value of physical knowledge, it is in effect the legitimacy of positive science, the possibility of knowing the object, that is criticised" (pp. i-ii). From the "crisis in modern physics" people hasten to draw sceptical conclusions (p. 14). Now, what is this crisis? During the first two-thirds of the nineteenth century the physicists agreed among themselves on everything essential. They believed in a purely mechanical explanation of nature: they assumed that physics is nothing but a complication of mechanics, namely, a molecular mechanics. They differed only as to the methods used in reducing physics to mechanics and as to the details of the mechanism.... At present the spectacle presented by the physico-chemical sciences seems completely changed. Extreme disagreement has replaced general unanimity, and no longer does it concern details, but leading and fundamental ideas. While it would be an exaggeration to say that each scientist has his own peculiar tendencies, it must nevertheless be noted that science, and especially physics, has, like art, its numerous schools, the conclusions of which often differ from, and sometimes are directly opposed and hostile to each other....

"From this one may judge the significance and scope of what has been called the crisis in modern physics.

"Down to the middle of the nineteenth century, traditional physics had assumed that it was sufficient merely to extend physics in order to arrive at a metaphysics of matter. This physics ascribed to its theories an ontological value. And its theories were all mechanistic. The traditional mechanism [Rey employs this word in the specific sense of a system of ideas which reduces physics to mechanics] thus claimed, over and above the results of experience, a *real* knowledge of the material universe. This was not a hypothetical account of experience; it was a dogma ..." (p. 16).

We must here interrupt the worthy "positivist." It is clear that he is describing the materialist philosophy of traditional physics but does not want to call the devil (materialism) by name. Materialism to a Humean must appear to be metaphysics, dogma, a transgression of the bounds of experience, and so forth. Knowing nothing of materialism, the Humean Rey has no conception whatever of dialectics, of the difference between dialectical materialism and metaphysical materialism, in Engels' meaning of the term. Hence, the relation between absolute and relative truth, for example, is absolutely unclear to Rey.

"... The criticism of traditional mechanism made during the whole of the second half of the nineteenth century weakened the premise of the ontological reality of mechanism. On the basis of these criticisms a philosophical conception of physics was founded which became almost traditional in philosophy at the end of the nineteenth century. Science was nothing but a symbolic formula, a method of notation *(repérage),* and since the methods of notation varied according to the schools, the conclusion was soon reached that only that was denoted which had been previously designed *(façonné)* by men for notation (or symbolisation). Science became a work of art for dilletantes, a work of art for utilitarians: views which could with legitimacy be generally interpreted as the negation of the possibility of science. A science which is a pure artifice for acting upon nature, a mere utilitarian technique, has no right to call itself science, without perverting the meaning of words. To say that science can be nothing but such an artificial means of action is to disavow science in the proper meaning of the term.

"The collapse of traditional mechanism, or, more precisely, the criticism to which it was subjected, led to the proposition that science itself had also collapsed. From the impossibility of adhering purely and simply to traditional mechanism it was inferred that science was impossible" (pp. 16-17). .

And the author asks: "Is the present crisis in physics a temporary and external incident in the evolution of science, or is science itself making an abrupt right-about-face and definitely abandoning the path it has hitherto pursued?..."

"If the [physical and chemical] sciences, which in history have been essentially emancipators, collapse in this crisis, which reduces them to the status of mere, technically useful recipes but deprives them of all significance from the standpoint of knowledge of nature, the result must needs be a complete revolution both in the art of logic and the history of ideas. Physics then loses all educational value; the spirit of positive science it represents becomes false and dangerous." Science can offer only practical recipes but no real knowledge. "Knowledge of the real must be sought and given by other means.... One must take another road, one must return to subjective intuition, to a mystical sense of reality, in a word, to the mysterious, all that of which one thought it had been deprived" (p. 19).

As a positivist, the author considers such a view wrong and the crisis in physics only temporary. We shall presently see how Rey purifies Mach, Poincaré and Co. of these conclusions. At present we shall confine ourselves to noting the fact of the "crisis" and its significance. From the last words of Rey quoted by us it is quite clear what reactionary elements have taken advantage of and aggravated this crisis.

Rey explicitly states in the preface to his work that "the fideist and anti-intellectualist movement of the last years of the nineteenth century" is seeking "to base itself on the general spirit of modern physics" (p. ii). In France, those who put faith above reason are called fideists (from the Latin *fides,* faith). Anti-intellectualism is a doctrine that denies the rights or claims of reason. Hence, in its philosophical aspect, the essence of the "crisis in modern physics" is that the old physics regarded its theories as "real knowledge of the material world," *i.e.,* the reflection of objective reality. The new trend in physics regards theories only as symbols, signs, and marks for practice, *i.e.*, it denies the existence of an objective reality independent of our mind and reflected by it. If Rey had used correct philosophical terminology, he would have said: the materialist theory of knowledge, instinctively accepted by the earlier physics, has been replaced by an idealist and agnostic theory of knowledge, which, against the wishes of the idealists and agnostics, has been taken advantage of by fideism.

But Rey does not present this replacement, which constitutes the crisis, as though all the modern physicists stand opposed to all the old physicists. No. He shows that in their epistemological trends the modern physicists are divided into three schools: the energeticist or conceptualist school; the mechanistic or neo-mechanistic school, to which the vast majority of physicists still adhere; and in between the two, the critical school. To the first belong Mach and Duhem; to the third, Henri Poincaré; to the second, Kirchhoff, Helmholtz, Thomson (Lord Kelvin), Maxwell—among the older physicists—and Larmor and Lorentz among the modern physicists. What the essence of the *two* basic trends is (for the third is not independent, but intermediate) may be judged from the following words of Rey's:

"Traditional mechanism constructed a system of the material world." Its doctrine of the structure of matter was based on "elements qualitatively homogeneous and identical"; and elements were to be regarded as "immutable, impenetrable," etc. Physics "constructed a *real* edifice out of *real* materials and *real* cement. The physicist possessed *material elements, the causes and modes* of their action, and the *real* laws of their action" (pp. 33-39). "The change in this view consists in the rejection of the ontological significance of the theories and in an exaggerated emphasis on the phenomenological significance of physics." The conceptualist view operates with "pure abstractions ... and seeks a purely abstract theory which will as far as possible eliminate the hypothesis of matter.... The notion of energy thus becomes the substructure of the new physics. This is why conceptualist physics may most often be called *energeticist physics*," although this designation does not fit, for example, such a representative of conceptualist physics as Mach (p. 45).

Rey's identification of energetics with Machism is not altogether correct, of course; nor is his assurance that the neo-mechanistic school as well is approaching a phenomenalist view of physics (p. 48), despite the profundity of its disagreement with the conceptualists. Rey's "new" terminology does not clarify, but rather obscures matters; but we could not avoid it if we were to give the reader an idea of how a "positivist" regards the crisis in physics. Essentially, the opposition of the "new" school to the old views fully coincides, as the reader may have convinced himself, with Kleinpeter's criticism of Helmholtz quoted above. In his presentation of the views of the various physicists Rey reflects the indefiniteness and vacillation of their philosophical views. The *essence* of the crisis in modern physics consists in the breakdown of the old laws and basic principles, in the rejection of an objective reality existing outside the mind, that is, in the replacement of materialism by idealism and agnosticism. "Matter has disappeared"—one may thus express the fundamental and characteristic difficulty in relation to many of the particular questions which has created this crisis. Let us pause to discuss this difficulty.

2. "MATTER HAS DISAPPEARED"

Such, literally, is the expression that may be encountered in the descriptions given by modern physicists of recent discoveries. For instance, L. Houllevigue, in his book *L'évolution des sciences,* entitles his chapter on the new theories of matter: "Does Matter Exist?" He says: "The atom dematerialises, matter disappears."[1] To see how easily fundamental philosophical conclusions are drawn from this by the Machians, let us take Valentinov. He writes: "The statement that the scientific explanation of the world can find a firm foundation *only* in materialism is nothing but a fiction, and what is more, an absurd fiction" (p. 67). He quotes as a destroyer of this absurd fiction Augusto Righi, the Italian physicist, who says that the electron theory "is not so much a theory of electricity as of matter; the new system simply puts electricity in the place of matter."[2] Having quoted these words (p. 64), Mr. Valentinov exclaims:

"Why does Righi permit himself to commit this offence against sacred matter? Is it perhaps because he is a solipsist, an idealist, a bourgeois criticist, an empirio-monist, or even someone worse?"

This remark, which seems to Mr. Valentinov to annihilate the materialists by its sarcasm, only discloses his virgin innocence on the subject of philosophical materialism. Mr. Valentinov has no suspicion of the *real* connection between philosophical idealism and the "disappearance of matter." The "disappearance of matter" *of which he speaks,* in imitation of the modern physicists, has no relation to the epistemological distinction between materialism and idealism. To make this clear, let us take one of the most consistent and clearest of the Machians, Karl Pearson. For him the physical universe consists of groups of sense-impressions. He illustrates "our conceptual model of the physical universe" by the following diagram, explaining, however, that it takes no account of relative sizes (*The Grammar of Science*, p. 282):—

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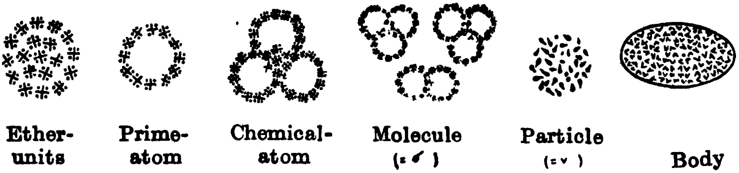
[1] L. Houllevigue, *L'évolution des sciences,* Paris, 1908, pp. 63, 87, 88; *cf.* his article: *"Les idées des physiciens sur la matière,"* in *L'Année psychologique,* 1908.

[2] Augusto Righi, *Die moderne Theorie der physikalischen Erscheinungen,* Leipzig 1905, S. 131.



In order to simplify his diagram, Karl Pearson entirely omits the question of the relation between ether and electricity, or positive electrons and negative electrons. But that is not important. What is important is that from Pearson's idealist standpoint "bodies" are first regarded as sense-impressions, and then the constitution of these bodies out of particles, particles out of molecules and so forth affects the changes in the model of the physical world, but in no way affects the question of whether bodies are symbols of perceptions, or perceptions images of bodies. Materialism and idealism differ in their respective answers to the question of the *source* of our knowledge and of the relation of knowledge (and of the "psychical" in general) to the *physical* world; while the question of the structure of matter, of atoms and electrons, is a question that concerns only this "physical world." When the physicists say that "matter is disappearing," they mean that hitherto science reduced its investigations of the physical world to three ultimate concepts: matter, electricity and ether; whereas now *only* the two latter remain. For it has become possible to reduce matter to electricity; the atom can be explained as resembling an infinitely small solar system, within which negative electrons move around a positive electron with a definite (and, as we have seen, enormously large) velocity. It is consequently possible to reduce the physical world from scores of elements to two or three elements (inasmuch as positive and negative electrons constitute "two essentially distinct kinds of matter," as the physicist Pellat says—Rey, *op. cit.* p. 294). Hence, natural science leads to the *"unity of matter" (ibid.)*[1]—such is the real meaning of the statement regarding the disappearance of matter, its replacement by electricity, etc., which is leading so many people astray. "Matter is disappearing" means that the limit within which we have hitherto known matter is vanishing and that our knowledge is penetrating deeper; properties of matter are disappearing which formerly seemed absolute, immutable, and primary (impenetrability, inertia, mass, etc.) and which are now revealed to be relative and characteristic only of certain states of matter. For the *sole* "property" of matter with whose recognition philosophical materialism is bound up is the property of *being an objective reality,* of existing outside our mind.

The error of Machism in general, as of the Machian new physics, is that it ignores this basis of philosophical materialism and the distinction between metaphysical materialism and dialectical materialism. The recognition of immutable elements, "of the immutable substance of things," and so forth, is not materialism, but *metaphysical, i.e.,* anti-dialectical, materialism. That is why J. Dietzgen emphasised that the "subject-matter of science is endless," that not only the infinite, but the "smallest atom" is immeasurable, unknowable to the end, *inexhaustible,* "for nature in all her parts has no beginning and no end" (*Kleinere philosophische Schriften,* S. 229-30). That is why Engels gave the example of the discovery of alizarin in coal tar and criticised *mechan-*

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[1] *Cf.* Oliver Lodge, *Electrons*, London, 1906. "The electrical theory of matter," the recognition of electricity as the "fundamental substance," is "an approximate accomplishment of that to what the philosophers strove always, that is, the unity of matter"; *cf.* also Righi, *Ueber die Struktur der Materie,* Leipzig 1908; J. J. Thomson, *The Corpuscular Theory of Matter,* London, 1907; P. Langevin, *"La physique des électrons"* in the *Revue générale des sciences,* 1905, pp. 257-76.

ical materialism. In order to present the question in the only correct way, that is, from the dialectical materialist standpoint, we must ask: Do electrons, ether *and so on* exist as objective realities outside the human mind or not? The scientists will also have to answer this question unhesitatingly; and they do invariably answer it in the *affirmative,* just as they unhesitatingly recognise that nature existed prior to man and prior to organic matter. Thus, the question is decided in favour of materialism, for the concept matter, as we already stated, epistemologically implies *nothing but* objective reality existing independently of the human mind and reflected by it.

But dialectical materialism insists on the approximate, relative character of every scientific theory of the structure of matter and its properties; it insists on the absence of absolute boundaries in nature, on the transformation of moving matter from one state into another, which is to us apparently irreconcilable with it, and so forth. However bizarre from the standpoint of "common sense" the transformation of imponderable ether into ponderable matter and *vice versa* may appear, however "strange" may seem the absence of any other kind of mass in the electron save electromagnetic mass, however extraordinary may be the fact that the mechanical laws of motion are confined only to a single sphere of natural phenomena and are subordinated to the more profound laws of electromagnetic phenomena, and so forth—all this is but another *corroboration* of dialectical materialism. It is mainly because the physicists did not know dialectics that the new physics strayed into idealism. They combated metaphysical (in Engels', and not the positivist, *i.e.,* Humean sense of the word) materialism and its one-sided "mechanism," and in so doing threw the baby out with the bath-water. Denying the immutability of the elements and the properties of matter known hitherto, they ended in denying matter, *i.e.,* the objective reality of the physical world. Denying the absolute character of some of the most important and basic laws, they ended in denying all objective law in nature and in declaring that a law of nature is a mere convention, "a limitation of expectation," "a logical necessity," and so forth. Insisting on the approximate and relative character of our knowledge, they ended in denying the object independent of the mind and reflected approximately-correctly and relatively-truthfully by the mind. And so on, and so forth, without end.

The opinions expressed by Bogdanov in 1899 regarding "the immutable essence of things," the opinions of Valentinov and Yushkevich regarding "substance," and so forth—are similar fruits of ignorance of dialectics. From Engels' point of view, the only immutability is the reflection by the human mind (when there is a human mind) of an external world existing and developing independently of the mind. No other "immutability," no other "essence," no other "absolute substance," in the sense in which these concepts were depicted by the empty professorial philosophy, exist for Marx and Engels. The "essence" of things, or "substance," is *also* relative; it expresses only the degree of profundity of man's knowledge of objects; and while yesterday the profundity of this knowledge did not go beyond the atom, and today does not go beyond the electron and ether, dialectical materialism insists on the temporary, relative, approximate character of all these *milestones* in the knowledge of nature gained by the progressing science of man. The electron is as *inexhaustible* as the atom, nature is infinite, but it infinitely *exists*. And it is this sole categorical, this sole unconditional recognition of nature's *existence* outside the mind and perceptions of man that distinguishes dialectical materialism from relativist agnosticism and idealism.

Let us cite two examples of the way in which the new physics wavers unconsciously and instinctively between dialectical materialism, which remains unknown to the bourgeois scientists, and "phenomenalism," with its inevitable subjectivist (and, subsequently, directly fideist) deductions.

This same Augusto Righi, from whom Mr. Valentinov was *unable* to get a reply on the question which interested him about materialism, writes in the introduction to his book: "What the electrons, or electrical atoms, really are remains even now a mystery; but in spite of this, the new theory is perhaps destined in time to achieve no small philosophical significance, since it is arriving at entirely new hypotheses regarding the structure of ponderable matter and is striving to reduce all phenomena of the external world to one common origin.

"For the positivist and utilitarian tendencies of our time such an advantage may be of small consequence, and a theory is perhaps regarded primarily as a means of conveniently ordering and summarising facts and as a guide in the search for further phenomena. But while in former times perhaps too much confidence was placed in the faculties of the human mind, and it was considered too easy to grasp the ultimate causes of all things, there is nowadays a tendency to fall into the opposite error" (*op. cit.*, p. 3).

Why does Righi dissociate himself here from the positivist and utilitarian tendencies? Because, while apparently he has no definite philosophical standpoint, he instinctively clings to the reality of the external world and to the recognition that the new theory is not only a "convenience" (Poincaré), not only an "empirio-symbol" (Yushkevich), not only a "harmonising" of experience (Bogdanov), or whatever else they call such subjectivist tricks, but a further step in the cognition of objective reality. Had this physicist been acquainted with *dialectical* materialism, his opinion of the error which is the opposite of the old metaphysical materialism might perhaps have become the starting point of a correct philosophy. But these people's whole environment estranges them from Marx and Engels and throws them into the embrace of vulgar official philosophy.

Rey too is entirely unfamiliar with dialectics. But he too is compelled to state that among the modern physicists there are those who continue the traditions of "mechanism" (*i.e.*, materialism). The path of "mechanism," says he, is pursued not only by Kirchhoff, Hertz, Boltzmann, Maxwell, Helmholtz and Lord Kelvin. "Pure mechanists, and in some respects more mechanist than anybody else, and representing the culmination *(l'aboutissant)* of mechanism, are those who follow Lorentz and Larmor in formulating an electrical theory of matter and who arrive at a denial of the constancy of mass, declaring it to be a function of motion. *They are all mechanists because they take real motion as their starting point*" (Rey's italics, pp. 290-91).

"...If, for example, the hypotheses of Lorentz, Larmor and Langevin were thanks to certain experimental confirmation, to obtain a sufficiently stable basis for the systematisation of physics, it would be certain that the laws of present-day mechanics are nothing but a corollary of the laws of electromagnetism: they would constitute a special case of the latter within well-defined limits. Constancy of mass and our principle of inertia would be valid only for moderate velocities of bodies, the term 'moderate' being taken in relation to our senses and to the phenomena which constitute our general experience. A general recasting of mechanics would result, and hence also, a general recasting of the systematisation of physics."

"Would this imply the abandonment of mechanism? By no means. The purely mechanist tradition would still be followed, and mechanism would follow its normal course of development" (pp. 293-95).

"Electronic physics, which should be ranked among the theories of a generally mechanist spirit, tends at present to impose its systematisation on physics. Although the fundamental principles of this electronic physics are not furnished by mechanics but by the experimental data of the theory of electricity, its spirit is mechanistic, because:

"(1) It uses *figurative (figurés), material* elements to represent physical properties and their laws; it expresses itself in terms of perception.

"(2) While it no longer regards physical phenomena as particular cases of mechanical phenomena, it regards mechanical phenomena as particular cases of physical phenomena. The laws of mechanics thus retain their *direct continuity* with the laws of physics; and the concepts of mechanics remain concepts of the same order as physico-chemical concepts. In traditional mechanism it was motions copied *(calqués)* from *relatively slow* motions, which, since they alone were known and most directly observable, were taken ... as a type of all possible motions. *Recent experiments,* on the contrary, show that it is necessary to *extend* our conception of possible motions. Traditional mechanics remains entirely intact, but it now applies only to *relatively slow* motions.... In relation to large velocities, the laws of motion are different. Matter appears to be reduced to electrical particles, the ultimate elements of the atom....

"(3) Motion, displacement in space, remains the only figurative element of physical theory.

"(4) Finally, what from the standpoint of the general spirit of physics comes before every other consideration is the fact that the conception of physics, its methods, its theories, and their relation to experience remains *absolutely identical* with the conception of mechanism, with the conception of physics held since the Renaissance" (pp. 46-47).

I have given this long quotation from Rey in full because owing to his perpetual anxiety to avoid "materialist metaphysics," it would have been impossible to expound his statements in any other way. But however much both Rey and the physicists of whom he speaks abjure materialism, it is nevertheless beyond question that mechanics was a copy of real motions of moderate velocity, while the new physics is a copy of real motions of enormous velocity. The recognition of theory as a copy, as an approximate copy of objective reality, is materialism. When Rey says that among modern physicists there "is a reaction against the conceptualist [Machian] and energeticist school," and when he ranks the physicists of the electron theory among the representatives of this reaction (p. 46), we could desire no better corroboration of the fact that the struggle is essentially between the materialist and the idealist tendencies. But we must not forget that, apart from the prejudices against materialism common to all educated philistines, the most outstanding theoreticians exhibit a complete ignorance of dialectics.

3. IS MOTION WITHOUT MATTER CONCEIVABLE?

The fact that philosophical idealism is attempting to make use of the new physics, or that idealist conclusions are being drawn from the latter, is due not to the discovery of new kinds of substance and force, of matter and motion, but to the fact that an attempt is being made to conceive motion without matter. And it is the essence of this attempt which our Machians fail to examine. They were unwilling to take account of Engels' statement that "motion without matter is *inconceivable.*" J. Dietzgen in 1869, in his *Wesen der menschlichen Kopfarbeit,* expressed the same idea as Engels, although, it is true, not without his usual muddled attempts to "reconcile" materialism and idealism. Let us leave aside these attempts, which are to a large extent to be explained by the fact that Dietzgen is arguing against Büchner's non-dialectical materialism, and let us examine Dietzgen's own statements on the question under consideration. He says: "They [the idealists] want to have the general without the particular, mind without matter, force without substance, science without experience or material, the absolute without the relative" (*Das Wesen der menschlichen Kopfarbeit,* 1903, S. 108). Thus the endeavour to divorce motion from matter, force from substance, Dietzgen associates with idealism, compares with the endeavour to divorce thought from the brain. "Liebig," Dietzgen continues, "who is especially fond of straying from his inductive science into the field of speculation, says in the spirit of idealism: 'force cannot be seen'. . ." (p. 109). "The spiritualist or the idealist *believes* in the spiritual, *i.e.,* ghostlike and inexplicable, nature of force. . ." (p. 110). "The antithesis between force and matter is as old as the antithesis between idealism and materialism. . ." (p. 111). "Of course, there is no force without matter, no matter without force; forceless matter and matterless force are absurdities. If there are idealist natural scientists who believe in the immaterial existence of forces . . . on this point they are not natural scientists . . . but seers of ghosts" (p. 114).

We thus see that scientists who were prepared to grant that motion is conceivable without matter were to be encountered forty years ago too, and that "on this point" Dietzgen declared them to be seers of ghosts. What, then, is the connection between philosophical idealism and the divorce of matter from motion, the separation of substance from force? Is it not "more economical," indeed, to conceive motion without matter?

Let us imagine a consistent idealist who holds that the entire world is his sensation, his idea, etc. (if we take "nobody's" sensation or idea, this changes only the variety of philosophical idealism but not its essence). The idealist would not even think of denying that the world is motion, *i.e.*, the motion of my thoughts, ideas, sensations. The question as to *what* moves, the idealist will reject and regard as absurd: what is taking place is a change of my sensations, my ideas come and go, and nothing more. Outside me there is nothing. "It moves"—and that is all. It is impossible to conceive a more "economical" way of thinking. And no proofs, syllogisms, or definitions are capable of refuting the solipsist if he consistently adheres to his view.

The fundamental distinction between the materialist and the adherent of idealist philosophy consists in the fact that the sensation, perception, idea, and the mind of man generally, is regarded as an image of objective reality. The world is the movement of this objective reality reflected by our consciousness. To the movement of ideas, perceptions, etc., there corresponds the movement of matter outside me. The concept matter expresses nothing more than the objective reality which is given us in sensation. Therefore, to divorce motion from matter is equivalent to divorcing thought from objective reality, or to divorcing my sensations from the external world—in a word, it is to go over to idealism. The trick which is usually performed in denying matter, and in assuming motion without matter, consists in ignoring the relation of matter to thought. The question is presented as though this relation did not exist, but in reality it is introduced surreptitiously; at the beginning of the argument it remains unexpressed, but subsequently crops up more or less imperceptibly.

Matter has disappeared, they tell us, wishing from this to draw epistemological conclusions. But has thought remained?—we ask. If not, if with the disappearance of matter thought has also disappeared, if with the disappearance of the brain and nervous system ideas and sensations, too, have disappeared—then it follows that everything has disappeared. And your argument has disappeared as a sample of "thought" (or lack of thought)! But if it has remained—if it is assumed that with the disappearance of matter, thought (idea, sensation, etc.) does not disappear, then you have surreptitiously gone over to the standpoint of philosophical idealism. And this always happens with people who wish, for "economy's sake," to conceive of motion without matter, for *tacitly,* by the very fact that they continue to argue, they are acknowledging the existence of thought *after* the disappearance of matter. This means that a very simple, or a very complex philosophical idealism is taken as a basis; a very simple one, if it is a case of frank solipsism (*I* exist, and the world is only *my* sensation); a very complex one, if instead of the thought, ideas and sensations of a living person, a dead abstraction is posited, that is, nobody's thought, nobody's idea, nobody's sensation, but thought in general (the Absolute Idea, the Universal Will, etc.), sensation as an indeterminate "element," the "psychical," which is substituted for the whole of physical nature, etc., etc. Thousands of shades of varieties of philosophical idealism are possible and it is always possible to create a thousand and first shade; and to the author of this thousand and first little system (empirio-monism, for example) what distinguishes it from the rest may appear to be momentous. From the standpoint of materialism, however, these distinctions are absolutely unessential. What is essential is the point of departure. What is essential is that the attempt to *think* of motion without matter smuggles in *thought* divorced from matter—and that is philosophical idealism.

Therefore, for example, the English Machian Karl Pearson, the clearest and most consistent of the Machians, who is averse to verbal trickery, directly begins the seventh chapter of his book, devoted to "matter," with the characteristic heading "All things move—but only in conception." "It is therefore, for the sphere of perception, idle to ask what moves and why it moves" (*The Grammar of Science*, p. 243).

Therefore, too, in the case of Bogdanov, his philosophical misadventures in fact began before his acquaintance with Mach. They began from the moment he put his trust in the assertion of the eminent chemist, but poor philosopher, Ostwald, that motion can be thought of without matter. It is all the more fitting to pause on this long-past episode in Bogdanov's philosophical development since it is impossible when speaking of the connection between philosophical idealism and certain trends in the new physics to ignore Ostwald's "energetics."

"We have already said," wrote Bogdanov in 1899, "that the nineteenth century did not succeed in ultimately ridding itself of the problem of 'the immutable essence of things.' This essence, under the name of 'matter,' even holds an important place in the world outlook of the foremost thinkers of the century" (*Fundamental Elements of the Historical Outlook*, p. 38).

We said that this is a sheer muddle. The recognition of the objective reality of the outer world, the recognition of the existence outside our mind of eternally moving and eternally changing matter, is here confused with the recognition of the immutable essence of things. It is hardly possible that Bogdanov in 1899 did not rank Marx and Engels among the "foremost thinkers." But he obviously did not understand dialectical materialism.

"... In the processes of nature two aspects are usually still distinguished: matter and its motion. It cannot be said that the concept of matter is distinguished by great clarity. It is not easy to give a satisfactory answer to the question—what is matter? It is defined as the 'cause of sensations' or as the 'permanent possibility of sensation'; but it is evident that matter is here confused with motion...."

It is evident that Bogdanov is arguing incorrectly. Not only does he confuse the materialist recognition of an objective source of sensations (unclearly formulated in the words "cause of sensations") with Mill's agnostic definition of matter as the permanent *possibility* of sensation, but the chief error here is that the author, having boldly approached the question of the existence or non-existence of an objective source of sensations, abandons this question half-way and jumps to another question, the question of the existence or non-existence of matter without motion. The idealist may regard the world as the *movement* of our sensations (even though "socially organised" and "harmonised" to the highest degree); the materialist regards the world as the movement of an objective source, of an objective model of our sensations. The metaphysical, *i.e.*, anti-dialectical, materialist may accept the existence of matter without motion (even though temporarily, before "the first impulse," etc.). The dialectical materialist not only regards motion as an inseparable property of matter, but rejects the simplified view of motion and so forth.

"... The most exact definition would, perhaps, be the following: 'matter is what moves'; but this is as devoid of content as though one were to say that matter is the subject of a sentence, the predicate of which is 'moves.' The fact, most likely, is that in the epoch of statics men were wont to see something necessarily solid in the role of the subject, an 'object,' and such an inconvenient thing for statics as 'motion' they were prepared to tolerate only as a predicate, as one of the attributes of 'matter.'"

This is something like the charge Akimov brought against the *Iskra*-ists,[1] namely, that their programme did not contain the word proletariat in the nominative case! Whether

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[1] V. P. Akimov (1875-1921)—One of the leaders of "Economism"—an opportunistic trend in Social-Democracy at the end of the nineteenth and beginning of the twentieth centuries.

Iskra-ists—those siding with the *Iskra*, the first all-Russian newspaper of the revolutionary Marxists, founded by V. I. Lenin at the end of 1900. *Iskra* drew up the draft Party programme for the Second Congress of the RSDLP (1903), which Akimov had critiwe say the world is moving matter, or that the world is material motion, makes no difference whatever.

"...But energy must have a vehicle—say those who believe in matter. Why?—asks Ostwald, and with reason. Must nature necessarily consist of subject and predicate?" (P. 39.)

Ostwald's answer, which so pleased Bogdanov in 1899, is plain sophistry. Must our judgments necessarily consist of electrons and ether?—one might retort to Ostwald. As a matter of fact, the mental elimination from "nature" of matter as the "subject" only implies the tacit admission into *philosophy* of *thought* as the "subject," (*i.e.,* as the primary, the starting point, independent of matter). Not the subject, but the objective source of sensation is eliminated, and *sensation* becomes the "subject," *i.e.,* philosophy becomes Berkeleian, no matter in what trappings the word "sensation" is afterwards decked. Ostwald endeavoured to avoid this inevitable philosophical alternative (materialism or idealism) by an indefinite use of the word "energy," but this very endeavour only once again goes to prove the futility of such artifices. If energy is motion, you have only shifted the difficulty from the subject to the predicate, you have only changed the question, does matter move? into the question, is energy material? Does the transformation of energy take place outside my mind, independently of man and mankind, or are these only ideas, symbols, conventional signs, and so forth? And this question proved fatal to the "energeticist" philosophy, that attempt to disguise old epistemological errors by a "new terminology."

Here are examples of how the energeticist Ostwald got into a muddle. In the preface to his *Lectures on Natural Philosophy*[1] he declares that he regards "as a great gain the simple and natural removal of the old difficulties in the way of uniting the concepts matter and spirit by subordinat-

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cised. Soon after the Second Congress the paper passed into the hands of the Mensheviks.—*Trans.*

[1] Wilhelm Ostwald. *Vorlesungen über Naturphilosophie,* 2. Aufl., Leipzig 1902, S. viii.

ing both to the concept energy." This is not a gain, but a loss, because the question whether epistemological investigation (Ostwald does not clearly realise that he is raising an epistemological and not a chemical issue!) is to be conducted along materialist or idealist lines is not being solved but is being confused by an arbitrary use of the term "energy." Of course, if we "subordinate" both matter and spirit to this concept, the *verbal* annihilation of the antithesis is beyond question, but the absurdity of the belief in sprites and hobgoblins, for instance, is not removed by calling it "energetics." On page 394 of Ostwald's *Vorlesungen* we read: "That all external events may be presented as an interaction of energies can be most simply explained if our mental processes are themselves energetic and impose *(aufprägen)* this property of theirs on all external phenomena." This is pure idealism: it is not our thought that reflects the transformation of energy in the external world, but the external world that reflects a certain "property" of our mind! The American philosopher Hibben, pointing to this and similar passages in Ostwald's *Vorlesungen,* aptly says that Ostwald "appears ... in a Kantian disguise": the explicability of the phenomena of the external world is deduced from the properties of our mind! "It is obvious therefore," says Hibben, "that if the primary concept of energy is so defined as to embrace psychical phenomena, we have no longer the simple concept of energy as understood and recognised in scientific circles or even among the *Energetiker* themselves. . . ."[1] The transformation of energy is regarded by science as an objective process independent of the minds of men and of the experience of mankind, that is to say, it is regarded materialistically. And by energy, Ostwald himself in many instances, probably in the vast majority of instances, means *material* motion.

And this accounts for the remarkable phenomenon that Bogdanov, a disciple of Ostwald, having become a disciple of Mach, began to reproach Ostwald not because he does not adhere consistently to a materialistic view of energy, but because he admits the materialistic view of energy (and at times even takes it as his basis). The materialists criticise Ostwald because he lapses into idealism, because he attempts to reconcile materialism and idealism. Bogdanov criticises Ostwald from the *idealist* standpoint. In 1906 he wrote: "... Ostwald's 'energetics,' hostile to atomism but for the rest closely akin to the old materialism, enlisted my heartiest sympathy. I soon noticed, however, an important contradiction in his *Naturphilosophie*: although he frequently emphasises the *purely methodological* significance of the concept 'energy,' in a great number of instances he himself fails to adhere to it. He every now and again converts 'energy' from a pure symbol of correlations between the facts of experience into the *substance* of experience, into the 'world stuff'" (*Empirio-Monism*, Bk. III, pp. xvi-xvii).

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[1] J. G. Hibben, "The Theory of Energetics and its Philosophical Bearings," *The Monist,* April 1903, Vol. XIII, pp. 329-30.

Energy is a pure symbol! After this Bogdanov may dispute as much as he pleases with the "empirio-symbolist" Yushkevich, with the "pure Machians," the empirio-criticists, etc.—from the standpoint of the materialists it is a dispute between a man who believes in a yellow devil and a man who believes in a green devil. For the important thing is not the differences between Bogdanov and the other Machians, but what they have in common, to wit: the *idealist* interpretation of "experience" and "energy," the denial of objective reality, adaptation to which constitutes human experience and the copying of which constitutes the only scientific "methodology" and scientific "energetics."

"It [Ostwald's energetics] is indifferent to the material of the world, it is fully compatible with both the old materialism and pan-psychism" (*i.e.*, philosophical idealism?) (p. xvii). And Bogdanov departed from muddled energetics *not* by the materialist road *but by the idealist* road.... "When 'energy' is represented as substance it is nothing but the old materialism minus the absolute atoms—materialism with a correction in the sense of the *continuity* of the existing" (*ibid.*). Yes, Bogdanov left the "old" materialism, *i.e.*, the metaphysical materialism of the scientists, not for *dialectical* materialism, which he understood as little in 1906 as he did in 1899, but for idealism and fideism; for no educated representative of modern fideism, no immanentist, no "neo-criticist," and so forth, will object to the "methodological" conception of energy, to its interpretation as a "pure symbol of correlation of the facts of experience." Take Paul Carus, with whose mental make-up we have already become sufficiently acquainted, and you will find that this Machian criticises Ostwald *in the very same way as Bogdanov*: "...Materialism and energetics are exactly in the same predicament" (*The Monist,* 1907, Vol. XVII, No. 4, p. 536). "We are very little helped by materialism when we are told that everything is matter, that bodies are matter, and that thoughts are merely a function of matter, and Professor Ostwald's energetics is not a whit better when it tells us that matter is energy, and that the soul too is only a factor of energy" (p. 533).

Ostwald's energetics is a good example of how quickly a "new" terminology becomes fashionable, and how quickly it turns out that a somewhat altered mode of expression can in no way eliminate fundamental philosophical questions and fundamental philosophical trends. Both materialism and idealism can be expressed in terms of "energetics" (more or less consistently, of course) just as they can be expressed in terms of "experience," and the like. Energeticist physics is a source of new idealist attempts to conceive motion without matter—because of the disintegration of particles of matter which hitherto had been accounted non-disintegrable and because of the discovery of heretofore unknown forms of material motion.

4. THE TWO TRENDS IN MODERN PHYSICS AND ENGLISH SPIRITUALISM

In order to illustrate concretely the philosophical battle raging in present-day literature over the various conclusions drawn from the new physics, we shall let certain of the direct participants in the "fray" speak for themselves, and we shall begin with the English. The physicist Arthur W. Rücker defends one trend—from the standpoint of the natural scientist; the philosopher James Ward another trend—from the standpoint of epistemology.

At the meeting of the British Association held in Glasgow in 1901, A. W. Rücker, the president of the physics section, chose as the subject of his address the question of the value of physical theory and especially the doubts that have arisen as to the existence of atoms, and of the ether. The speaker referred to the physicists Poincaré and Poynting (an Englishman who shares the views of the symbolists, or Machians), the philosopher Ward, and to E. Haeckel's famous book as having raised this problem, and attempted to present his own views.[1]

"The question at issue," said Rücker, "is whether the hypotheses which are at the base of the scientific theories now most generally accepted, are to be regarded as accurate descriptions of the constitution of the universe around us, or merely as convenient fictions." (In the terms used in our controversy with Bogdanov, Yushkevich and Co.: are they a copy of objective reality, of moving matter, or are they only a "methodology," a "pure symbol," mere "forms of organisation of experience"?) Rücker agrees that in practice there may prove to be no difference between the two theories; the direction of a river can be determined as well by one who examines only the blue streak on a map or diagram as by one who knows that this streak represents a real river. Theory, from the standpoint of a convenient fiction, will be an "aid to memory," a means of "producing order" in our observations in accordance with some artificial system, of "arranging our knowledge," reducing it to equations, etc. We can, for instance, confine ourselves to declaring heat to be a form of motion or energy, thus exchanging "a vivid conception of moving atoms for a colourless statement of heat energy, the real nature of which we do not attempt to define." While fully recognising the possibility of achieving great scientific successes by this method, Rücker "ventures to assert that the exposition of such a system of tactics cannot be regarded as the last word of science in the struggle for the truth. The questions still force themselves upon us: Can we argue back from the phenomenon displayed by matter to the constitution of matter itself; whether we have any reason to believe that the sketch which science has already drawn is to some extent a copy, and not a mere diagram of the truth?"

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[1] The British Association at Glasgow, 1901. Presidential address by Professor A. W. Rücker, in *The Scientific American Supplement*, 1901, Nos. 1345 and 1346.

Analysing the problem of the structure of matter, Rücker takes air as an example, saying that it consists of gases and that science resolves "an elementary gas into a mixture of atoms and ether.... There are those who cry 'Halt'; molecules and atoms cannot be directly perceived; they are mere conceptions, which have their uses, but cannot be regarded as realities." Rücker meets this objection by referring to one of numberless instances in the development of science: the rings of Saturn appear to be a continuous mass when observed through a telescope. The mathematicians proved by calculation that this is impossible and spectral analysis corroborated the conclusion reached on the basis of the calculations. Another objection: properties are attributed to atoms and ether such as our senses do not disclose in ordinary matter. Rücker answers this also, referring to such examples as the diffusion of gases and liquids. A number of facts, observations and experiments prove that matter consists of discrete particles or grains. Whether these particles, atoms, are distinct from the surrounding "original medium" or "basic medium" (ether), or whether they are parts of this medium in a particular state, is still an open question, and has no bearing on the theory of the existence of atoms. There is no ground for denying *a priori* the evidence of experiments showing that "quasi-material substances" exist which differ from ordinary matter (atoms and ether). Particular errors are here inevitable, but the aggregate of scientific data leaves no room for doubting the existence of atoms and molecules.

Rücker then refers to the new data on the structure of atoms, which consist of corpuscles (electrons) charged with negative electricity, and notes the similarities in the results of various experiments and calculations on the size of molecules: the "first approximation" gives a diameter of about 100 millimicrons (millionths of a millimetre). Omitting Rücker's particular remarks and his criticism of neo-vitalism, we quote his conclusions:

"Those who belittle the ideas which have of late governed the advance of scientific theory, too often assume that there is no alternative between the opposing assertions that atoms and the ether are mere figments of the scientific imagination, and that, on the other hand, a mechanical theory of the atoms and the ether, which is now confessedly imperfect, would, if it could be perfected, give us a full and adequate representation of the underlying realities. For my part I believe that there is a *via media*." A man in a dark room may discern objects dimly, but if he does not stumble over the furniture and does not walk into a looking-glass instead of through a door, it means that he sees some things correctly. There is no need, therefore, either to renounce the claim to penetrate below the surface of nature, or to claim that we have already fully unveiled the mystery of the world around us. "It may be granted that we have not yet framed a consistent image either of the nature of the atoms or of the ether in which they exist, but I have tried to show that in spite of the tentative nature of some of our theories, in spite of many outstanding difficulties, the atomic theory unifies so many facts, simplifies so much that is complicated, that we have a right to insist—at all events until an equally intelligible rival hypothesis is produced—that the main structure of our theory is true: that atoms are not merely aids to puzzled mathematicians, but physical realities."

That is how Rücker ended his address. The reader will see that the speaker did not deal with epistemology, but as a matter of fact, doubtless in the name of a host of scientists, he was essentially expounding an instinctive materialist standpoint. The gist of his position is this: The theory of physics is a copy (becoming ever more exact) of objective reality. The world is matter in motion, our knowledge of which grows ever more profound. The inaccuracies of Rücker's philosophy are due to an unnecessary defence of the "mechanical" (why not electromagnetic?) theory of ether motions and to a failure to understand the relation between relative and absolute truth. This physicist lacks *only* a knowledge of *dialectical* materialism (if we do not count, of course, those very important social considerations which induce English professors to call themselves "agnostics").

Let us now see how the spiritualist James Ward criticised this philosophy: "Naturalism is not science, and the mechanical theory of Nature, the theory which serves as its foundation, is no science either.... Nevertheless, though Naturalism and the natural sciences, the Mechanical Theory of the Universe and mechanics as a science are logically distinct, yet the two are at first sight very similar and historically are very closely connected. Between the natural sciences and philosophies of the idealist (or spiritualist) type there is indeed no danger of confusion, for all such philosophies necessarily involve criticism of the epistemological assumptions which science unconsciously makes."[1] True! The natural sciences *unconsciously* assume that their teachings reflect objective reality, and *only* such a philosophy is reconcilable with the natural sciences! "... Not so with Naturalism, which is as innocent of any theory of knowledge as science itself. In fact Naturalism, like Materialism, is only physics treated as metaphysics.... Naturalism is less dogmatic than Materialism, no doubt, owing to its agnostic reservation as to the nature of ultimate reality; but it insists emphatically on the priority of the material aspect of its Unknowable."

The materialist treats physics as metaphysics! A familiar argument. By metaphysics is meant the recognition of an objective reality outside man. The spiritualists agree with the Kantians and Humeans in such reproaches against materialism. This is understandable; for without doing away with the *objective* reality of things, bodies and objects known to everyone, it is impossible to clear the road for "real conceptions" in Rehmke's sense!...

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[1] James Ward, *Naturalism and Agnosticism*, 1906, Vol. 1, p. 303.

"When the essentially philosophical question, how best to systematise experience as a whole [a plagiarism from Bogdanov, Mr. Ward!], arises, the naturalist ... contends that we must begin from the physical side. Then only are the facts precise, determinate, and rigorously concatenated: every thought that ever stirred the human heart ... can, it holds, be traced to a perfectly definite redistribution of matter and motion.... That propositions of such philosophic generality and scope are legitimate deductions from physical science, few, if any, of our modern physicists are bold enough directly to maintain. But many of them consider that their science itself is attacked by those who seek to lay bare the latent metaphysics, the physical realism, on which the Mechanical Theory of the Universe rests.... The criticism of this theory in the preceding lectures has been so regarded [by Rücker].... In point of fact my criticism [of this "metaphysics," so detested by all the Machians too] rests throughout on the expositions of a school of physicists—if one might call them so—steadily increasing in number and influence, who reject entirely the almost mediæval realism.... This realism has remained so long unquestioned, that to challenge it now seems to many to spell scientific anarchy. And yet it surely verges on extravagance to suppose that men like Kirchhoff or Poincaré—to mention only two out of many distinguished names—who do challenge it, are seeking 'to invalidate the methods of science.'... To distinguish them from the old school, whom we may fairly term physical realists, we might call the new school physical symbolists. The term is not very happy, but it may at least serve to emphasise the one difference between the two which now specially concerns us. The question at issue is very simple. Both schools start, of course, from the same perceptual experiences; both employ an abstract conceptual system, differing in detail but essentially the same; both resort to the same methods of verification. But the one believes that it is getting nearer to the ultimate reality and leaving mere appearances behind it; the other believes that it is only substituting a generalised descriptive scheme that is intellectually manageable, for the complexity of concrete facts.... In either view the value of physics as systematic knowledge *about* [Ward's italics] things is unaffected; its possibilities of future extension and of practical application are in either case the same. But the speculative difference between the two is immense, and in this respect the question which is right becomes important."

The question is put by this frank and consistent spiritualist with remarkable truth and clarity. Indeed, the difference between the two schools in modern physics is *only* philosophical, only epistemological. Indeed, the basic distinction is *only* that one recognises the "ultimate" (he should have said objective) reality reflected by our theory, while the other denies it, regarding theory as only a systematisation of experience, a system of empirio-symbols, and so on and so forth. The new physics, having found new aspects of matter and new forms of its motion, raised the old philosophical questions because of the collapse of the old physical concepts. And if the people belonging to "intermediate" philosophical trends ("positivists," Humeans, Machians) are unable to put the question at issue distinctly, it remained for the outspoken idealist Ward to tear off the veil.

"...Sir A. W. Rücker ... devoted his Inaugural Address to a defence of physical realism against the symbolic interpretations recently advocated by Professors Poincaré and Poynting and by myself" (pp. 305-06; and in other parts of his book Ward adds to this list the names of Duhem, Pearson and Mach; see Vol. II, pp. 161, 63, 57, 75, 83, etc.).

"...He [Rücker] is constantly talking of 'mental pictures,' while constantly protesting that atoms and ether must be more than these. Such procedure practically amounts to saying: In this case I can form no other picture, and therefore the reality must be like it.... He [Rücker] is fair enough to allow the abstract possibility of a different mental picture. . . . Nay, he allows 'the tentative nature of some of our theories'; he admits 'many outstanding difficulties.' After all, then, he is only defending a working hypothesis, and one, moreover, that has lost greatly in prestige in the last half century. But if the atomic and other theories of the constitution of matter are but working hypotheses, and hypotheses strictly confined to physical phenomena, there is no justification for a theory which maintains that mechanism is fundamental everywhere and reduces the facts of life and mind to epiphenomena—makes them, that is to say, a degree more phenomenal, a degree less real than matter and motion. Such is the mechanical theory of the universe. Save as he seems unwittingly to countenance that, we have then no quarrel with Sir Arthur Rücker" (pp. 314-15).

It is, of course, utterly absurd to say that materialism ever maintained that consciousness is "less" real, or necessarily professed a "mechanical" picture of the world, and not an electromagnetic, or some other, immeasurably more complex, picture of the world as *matter in motion*. But in a truly adroit manner, much more skilfully than our Machians (*i.e.*, muddled idealists), the outspoken and straightforward idealist Ward *seizes upon* the weak points in "instinctive" natural-historical materialism, as, for instance, its inability to explain the relation of relative and absolute truth. Ward turns somersaults and declares that since truth is relative, approximate, only "tentative," it cannot reflect reality! But, on the other hand, the question of atoms, etc., as "a working hypothesis" is very correctly put by the spiritualist. Modern, cultured fideism (which Ward directly deduces from his spiritualism) *does not think of demanding* anything more than the declaration that the concepts of natural science are "working hypotheses." We will, sirs, surrender science to you scientists, provided you surrender epistemology, philosophy, to us—such is the condition for the cohabitation of the theologians and professors in the "advanced" capitalist countries.

Among the other points on which Ward connects his epistemology with the "new" physics must be counted his determined attack on *matter*. What is matter and what is energy?—asks Ward, mocking at the plethora of hypotheses and their contradictoriness. Is it ether or ethers?—or, perhaps, some new "perfect fluid," arbitrarily endowed with new and improbable qualities? And Ward's conclusion is: "... we find nothing definite except movement left. Heat is a mode of motion, elasticity is a mode of motion, light and magnetism are modes of motion. Nay, mass itself is, in the end, supposed to be but a mode of motion of a something that is neither solid, nor liquid nor gas, that is neither itself a body nor an aggregate of bodies, that is not phenomenal and must not be noumenal, a veritable apeiron [a term used by the Greek philosophers signifying: infinite, boundless] on which we can impose our own terms" (Vol. I, p. 140).

The spiritualist is true to himself when he divorces motion from matter. The movement of bodies is transformed in nature into a movement of something that is not a body with a constant mass, into a movement of an unknown charge of an unknown electricity in an unknown ether—this dialectics of *material* transformation, performed in the laboratory and in the factory, serves in the eyes of the idealist (as in the eyes of the public at large, and of the Machians) not as a confirmation of materialist dialectics, but as evidence against materialism: "... The mechanical theory, as a professed explanation of the world, receives its death-blow from the progress of mechanical physics itself" (p. 143). The world is matter in motion, we reply, and the laws of its motion are reflected in mechanics in the case of moderate velocities and by the electromagnetic theory in the case of great velocities. "Extended, solid, indestructible atoms have always been the stronghold of materialistic views of the universe. But, unhappily for such views, the hard, extended atom was not equal to the demands which increasing knowledge made upon it" (p. 144). The destructibility of the atom, its inexhaustibility, the mutability of all forms of matter and of its motion, have always been the stronghold of dialectical materialism. All boundaries in nature are conditional, relative, movable, and express the gradual approximation of our reason towards the knowledge of matter. But this does not in any way prove that nature, matter itself, is a symbol, a conventional sign, *i.e.*, the product of our mind. The electron is to the atom as a full stop in this book is to the size of a building 200 feet long, 100 feet broad, and 50 feet high (Lodge); it moves with a velocity as high as 270,000 kilometres per second; its mass is a function of its velocity; it makes 500 trillion revolutions in a second—all this is much more complicated than the old mechanics; but it is, nevertheless, movement of matter in space and time. Human reason has discovered many amazing things in nature and will discover still more, and will thereby increase its power over nature. But this does not mean that nature is the creation of our mind or of abstract mind, *i.e.*, of Ward's God, Bogdanov's "substitution," etc.

"Rigorously carried out as a theory of the real world, that ideal [*i.e.*, the ideal of "mechanism"] lands us in nihilism: all changes are motions, for motions are the only changes we can understand, and so what moves, to be understood, must itself be motion" (p. 166). "As I have tried to show, and as I believe, the very advance of physics is proving the most effectual cure for this ignorant faith in matter and motion as the inmost substance rather than the most abstract symbols of the sum of existence.... We can never get to God through a mere mechanism" (p. 180).

Well, well, this is exactly in the spirit of the *Studies "in" the Philosophy of Marxism*! Mr. Ward, you ought to address yourself to Lunacharsky, Yushkevich, Bazarov and Bogdanov. They are a little more "shamefaced" than you are, but they preach the same doctrine.

5. THE TWO TRENDS IN MODERN PHYSICS AND GERMAN IDEALISM

In 1896, the Kantian idealist Hermann Cohen, with unusually triumphant exultation, wrote an introduction to the fifth edition of the *Geschichte des Materialismus*, the falsified history of materialism written by F. Albert Lange.

"Theoretical idealism," exclaims Cohen (S. xxvi), "has already begun ... to shake the ... materialism of the natural scientists, and perhaps ... in only a little while" will defeat it completely. Idealism is permeating *(Durchwirkung)* the new physics. "Atomism must give place to dynamism...." "It is a remarkable turn of affairs that research into the chemical problem of substance should have led to a fundamental triumph over the materialist view of matter. Just as Thales performed the first abstraction of the idea of substance, although ... he linked it with speculations on the electron, so the theory of electricity was destined to cause the greatest revolution in the conception of matter and, through the transformation of matter into force, bring about the victory of idealism" (p. xxix).

Hermann Cohen is as clear and definite as James Ward in pointing out the *fundamental* philosophical trends, and does not lose himself (as our Machians do) in petty distinctions between this and that energeticist, symbolist, empiriocriticist, empirio-monist idealism, and so forth. Cohen takes the *fundamental* philosophical trend of the school of physics that is now associated with the names of Mach, Poincaré and others and correctly describes this trend as *idealist*. "The transformation of matter into force" is here for Cohen the most important triumph of idealism, just as it was for the "ghost-seeing" scientists—whom J. Dietzgen exposed in 1869. Electricity is proclaimed a collaborator of idealism, because it has destroyed the old theory of the structure of matter, shattered the atom and discovered new forms of material motion, so unlike the old, so totally uninvestigated and unstudied, so unusual and "miraculous," that it permits nature to be presented as *non-material* (spiritual, mental, psychical) motion. Yesterday's limit to our knowledge of the infinitesimal particles of matter has disappeared, hence—concludes the idealist philosopher—matter has disappeared (but thought remains). Every physicist and every engineer knows that electricity is (material) motion, but nobody knows clearly *what* is moving, hence—concludes the idealist philosopher—we can dupe the philosophically uneducated with the seductively "economical" proposition: let us *conceive* motion *without matter*....

Hermann Cohen tries to enlist the famous physicist Heinrich Hertz as his ally. Hertz is ours—he is a Kantian, we sometimes find him admitting the *a priori*, he says. Hertz is ours, he is a Machian—contends the Machian Kleinpeter—for in Hertz we have glimpses of "the same subjectivist view of the nature of our concepts as in the case of Mach."[1] This strange dispute as to *where* Hertz belongs is a good example of how the idealists seize on the minutest error, the slightest vagueness of expression on the part of renowned scientists in order to justify their refurbished defence of fideism. As a matter of fact, Hertz's philosophical preface to his *Mechanik*[2] displays the usual standpoint of the scientist who has been intimidated by the professorial hue and cry against the "metaphysics" of materialism, but who nevertheless cannot overcome his instinctive conviction of the reality of the external world. This has been acknowledged by Kleinpeter himself, who on the one hand casts to the mass of readers thoroughly false popularly-written pamphlets on the theory of knowledge of *natural science*, in which Mach figures side by side with Hertz, while on the other, in specifically philosophical articles, he admits that "Hertz, as opposed to Mach, Pearson and Stallo, still clings to the prejudice that all physics can be explained in a mechanistic way,"[3] that he retains the concept of the thing-in-itself and "the usual standpoint of the physicists," and that Hertz still adheres to "a picture of the universe in itself...."[4]

It is interesting to note Hertz's view of energetics. He writes: "If we inquire into the real reason why physics at the present time prefers to express itself in terms of energetics, we may answer that it is because in this way it best avoids talking about things of which it knows very little.... Of course, we are now convinced that ponderable matter consists of atoms; and in certain cases we have fairly definite ideas of the magnitude of these atoms and of their motions. But the form of the atoms, their connection, their motions, in most cases ... all these are entirely hidden from us.... So that our conception of atoms is therefore in itself an important and interesting object for further investigations, but is not particularly adapted to serve as a known and secure foundation for mathematical theories" (*op. cit.,* Vol. III, p. 21). Hertz expected that further study of the ether would provide an explanation of the "nature of traditional matter ... its inertia and gravitational force" (Vol. I, p. 354).

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[1] *Archiv für systematische Philosophie*, Bd. V, 1898-99, S. 169-70.

[2] Heinrich Hertz, *Gesammelte Werke*, Bd. III, Leipzig 1894, esp. S. 1, 2, 49.

[3] *Kantstudien*, Bd. VIII, 1903, S. 309.

[4] *The Monist*, Vol. XVI, 1906, No. 2, p. 164; an article on Mach's "Monism."

It is evident from this that the possibility of a non-material view of energy did not even occur to Hertz. Energetics served the philosophers as an excuse to desert materialism for idealism. The scientist regards energetics as a convenient method of expressing the laws of material motion at a period when, if we may so express it, physicists had left the atom but had not yet arrived at the electron. This period is to a large extent not yet at an end; one hypothesis yields place to another; nothing whatever is known of the positive electron; only three months ago (June 22, 1908), Jean Becquerel reported to the French Academy of Science that he had succeeded in discovering this "new component part of matter" (*Comptes rendus des séances de l'Académie des Sciences,* p. 1311). How could idealist philosophy refrain from taking advantage of such an opportunity, when "matter" was still being "sought" by the human mind and was therefore no more than a "symbol," etc.

Another German idealist, one far more reactionary than Cohen, Eduard von Hartmann, devoted a whole book to the world outlook of modern physics (*Die Weltanschauung der modernen Physik,* Leipzig 1902). We are, of course, not interested in the special arguments of the author in favour of his own variety of idealism. For us it is important only to point out that this idealist notes the same phenomena as Rey, Ward and Cohen. "Modern physics had grown up on a realist basis," says Hartmann, "and it was only the Neo-Kantian and agnostic movement of our own time that led it to re-interpret its data in an idealist spirit" (p. 218). According to Hartmann, three epistemological systems constitute the basis of modern physics—hylo-kinetics (from the Greek *hyle*—matter, and *kinesis*—motion—*i.e.*, the recognition of physical phenomena as matter in motion), energetics, and dynamism (*i.e.*, the recognition of force without substance). Of course, the idealist Hartmann favours "dynamism," from which he draws the conclusion that the laws of nature are world-thought, in a word, he "substitutes" the psychical for physical nature. But he is forced to admit that hylo-kinetics has the majority of physicists on its side, that it is the system that "is most frequently employed" (p. 190), that its serious defect is "materialism and atheism, which threaten from pure hylo-kinetics" (p. 189). The author quite justly regards energetics as an intermediary system and calls it agnosticism (p. 136). Of course, it is an "ally of pure dynamism, for it dethrones substance" (pp. vi, 192), but Hartmann dislikes its agnosticism as a form of "Anglomania," which is incompatible with the genuine idealism of a true-German reactionary.

It is highly instructive to see how this irreconcilable partisan idealist (non-partisans in philosophy are just as hopelessly thick-headed as they are in politics) explains to the physicists what it means to follow one epistemological trend or another. "Only a very few of the physicists who follow this fashion," writes Hartmann in reference to the idealist interpretation of the latest results in physics, "realise the scope and importance of such an interpretation. They have failed to observe that physics with its specific laws has retained significance only in so far as, despite its idealism, it has adhered to *realistic* basic propositions, *viz.*, the existence of things-in-themselves, their real mutability in time, real causality.... Only by granting these realistic premises (the transcendental validity of causality, time and three-dimensional... space...) *i.e.*, only on the condition that nature, of whose laws physics speaks, coincides with a ...

realm of things-in-themselves, can one speak of natural laws as distinct from psychological laws. Only if natural laws operate in a realm independent of our mind can they serve as an explanation of the fact that the logically necessary effects of our images are always images of the natural-historically necessary effects of the unknown which they reflect or symbolise in our consciousness" (pp. 218-19).

Hartmann rightly feels that the idealism of the new physics is nothing but a *fashion,* and not a serious philosophical turn away from natural-historical materialism; and he, therefore, correctly explains to the physicists that in order to transform the "fashion" into consistent, integral philosophical idealism it is necessary radically to modify the doctrine of the objective reality of time, space, causality and natural law. We cannot regard only atoms, electrons and ether as mere symbols, as a mere "working hypothesis": time, space, the laws of nature and the whole external world must also be proclaimed a "working hypothesis." Either materialism, or the universal substitution of the psychical for the whole of physical nature; those anxious to confound the two are legion, but we and Bogdanov are not of their number.

Among the German physicists, Ludwig Boltzmann, who died in 1906, systematically combated the Machian tendency. We have already pointed out that as against those who were "carried away by the new epistemological dogmas" he simply and clearly reduced Machism to solipsism (see above, Chap. I, § 6). Boltzmann, of course, was afraid to call himself a materialist and even explicitly stated that he did not deny the existence of God.[1] But his theory of knowledge is essentially materialistic, and expresses—as is admitted by S. Günther,[2] the historian of natural science in the nineteenth century—the views of the majority of scientists. "We know," says Boltzmann, "of the existence of all things solely from the impressions they make on our senses" (*op.*

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[1] Ludwig Boltzmann, *Populäre Schriften,* Leipzig 1905, S. 187.

[2] Siegmund Günther, *Geschichte der anorganischen Naturwissenschaften im XIX. Jahrhundert,* Berlin 1901, S. 941-42.

cit., p. 29). Theory is an "image" (or copy) of nature, of the external world (p. 77). To those who say that matter is only a complex of sense-perceptions, Boltzmann points out that in that case other people are only the sensations of the speaker (p. 168). These "ideologues," as Boltzmann sometimes calls the philosophical idealists, present us with a "subjective picture of the world" (p. 176), whereas the author prefers a "simpler objective picture of the world." "The idealist compares the assertion that matter exists as well as our sensations with the child's opinion that a stone which is beaten experiences pain. The realist compares the assertion that one cannot conceive how the psychical can be formed from the material, or even from the play of atoms, with the opinion of an uneducated person who asserts that the distance between the sun and the earth cannot be twenty million miles, for he cannot conceive it" (p. 186). Boltzmann does not deny that the ideal of science is to present spirit and volition as "complex actions of particles of matter" (p. 396).

L. Boltzmann frequently polemicised against Ostwald's energetics from the standpoint of a physicist, and argued that Ostwald could neither disprove nor eliminate the formula of kinetic energy (half the mass multiplied by the square of velocity) and that he was revolving in a vicious circle by first deducing energy from mass (by accepting the formula of kinetic energy) and then defining mass as energy (pp. 112, 139). This reminds me of Bogdanov's paraphrase of Mach in the third book of his *Empirio-Monism*. "In science," writes Bogdanov in reference to Mach's *Mechanik*, "the concept matter is reduced to the coefficient of mass as it appears in the equations of mechanics; upon accurate analysis, however, the coefficient of mass proves to be the reciprocal of the acceleration when two physical body-complexes interact" (p. 146). It is evident that if a certain *body* is taken as a unit, the motion (mechanical) of all other bodies can be expressed as a mere relation of acceleration. But this does not mean that "bodies" (*i.e.*, matter) disappear or cease to exist independently of our mind. When the whole world is reduced to the movement of electrons, it will be possible to eliminate the electron from all equations, because it will be everywhere assumed, and the correlation between groups or aggregates of electrons will reduce itself to their mutual acceleration, if the forms of motion prove to be as simple as those of mechanics.

Combating the "phenomenalist" physics of Mach and Co., Boltzmann maintained that "those who believe atomism to have been eliminated by differential equations, cannot see the wood for the trees..." (p. 144). "If we do not wish to entertain illusions as to the significance of a differential equation ... we cannot doubt that this picture of the world (expressed in differential equations) must again by its nature be an atomic one, *i.e.,* an instruction that the changes in time of a vast quantity of things arranged in three-dimensional space must be thought of in accordance with definite rules. The things can, of course, be similar or dissimilar, unchangeable or changeable" (p. 156). "If we are perfectly clear," said Boltzmann in an address delivered to the Congress of Scientists held in Munich in 1899, "that the phenomenalists cloaked in differential equations likewise base themselves on atom-like discrete units *(Einzelwesen)* which they have to picture as possessing now certain properties now others for each group of phenomena, the need for a simplified, uniform atomism will soon again be felt" (p. 223). The electron theory "is developing into an atomic theory of electricity as a whole" (p. 357). The unity of nature is revealed in the "astonishing analogy" between the differential equations of the various realms of phenomena. "The same equations can be regarded as solving the problems of hydrodynamics and of the theory of potentials. The theory of vortices in fluids and the theory of friction in gases *(Gasreibung)* reveal a most astonishing analogy to the theory of electromagnetism, etc." (p. 7). Those who accept "the theory of universal substitution" cannot escape the question: Who was it that thought of "substituting" physical nature so uniformly?

As if in answer to those who brush aside "the physicist of the old school," Boltzmann relates in detail how certain specialists in "physical chemistry" are adopting an epistemological position contrary to that of Machism. Vaubel, the author of "one of the best" comprehensive works of 1903 (according to Boltzmann), "takes up a definitely hostile attitude towards the so-called phenomenalism so often recommended today" (p. 381). "He tries rather to obtain as concrete and clear an idea as possible of the nature of atoms and molecules and of the forces and agencies acting between them, and this idea he attempts to bring into conformity with the most recent experiments in this field [ions, electrons, radium, Zeeman effect, etc.].... The author ... strictly adheres to the dualism of matter and energy,[1] which have this in common that each has a special law of conservation. In regard to matter, the author also holds fast to the dualism between ponderable matter and ether, yet regards the latter as material in the strictest sense" (p. 381). In the second volume of his work (theory of electricity) the author "from the very outset takes the view that the phenomena of electricity are determined by the interaction and movement of atom-like entities, the electrons" (p. 383).

Hence, we find that what the spiritualist James Ward admitted to be true of England applies also to Germany, namely, that the physicists of the realistic school systematise the facts and discoveries of recent years no less successfully than the physicists of the symbolist school and that the essential difference between them consists *"only"* in their epistemological points of view.[2]

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[1] Boltzmann wishes to say that the author does not attempt to conceive motion without matter. To speak of dualism here is ridiculous. Philosophical monism and dualism consist respectively in a consistent or inconsistent adherence to materialism or idealism.

[2] The work of Erich Becher, *Philosophische Voraussetzungen der exakten Naturwissenschaften,* Leipzig 1907, with which I became acquainted only after my book had been completed, confirms what has been said in this paragraph. Holding closest of all to the epistemological point of view of Helmholtz and Boltzmann, that is, to a "shamefaced" and incompletely thought-out materialism, the author devotes his work to a defence and interpretation of the fundamental

6. THE TWO TRENDS IN MODERN PHYSICS AND FRENCH FIDEISM

In France, idealist philosophy has seized upon the vacillations of Machian physics with no less determination. We have already seen how the neo-criticists greeted Mach's *Mechanik* and how they immediately discerned the idealist character of the principles of Mach's philosophy. The French Machian, Henri Poincaré, was even more successful in this respect. The most reactionary idealist philosophy, the implications of which were definitely fideistic, immediately seized upon his theory. An adherent of this philosophy, Le Roy, argued thus: the truths of science are conventional signs,

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premises of physics and chemistry. This defence naturally becomes converted into a fight against the fashionable but increasingly-resisted Machian trend in physics (*cf.* p. 91, etc.). E. Becher correctly characterises this tendency as *"subjective positivism"* (p. iii) and reduces the central point of his objection to it to a proof of the "hypothesis" of the external world (Chapters II-VII), to a proof of its "existence independently of human perceptions" *(Vom Wahrgenommenwerden unabhängige Existenz).* The denial of this "hypothesis" by the Machians frequently leads the latter to *solipsism* (pp. 78-82, etc.). "Mach's view that sensations and complexes of sensations, and not the external world" (p. 138), are the only subject matter of science, Becher calls "sensationalist monism" *(Empfindungsmonismus)* and classifies it with the "purely conscionalistic tendencies." This clumsy and absurd term is constructed from the Latin word *"conscientia"*—consciousness, and means nothing but philosophical idealism (*cf.* p. 156). In the last two chapters of the book E. Becher quite skilfully compares the old mechanical theory with the new electrical theory of matter and world-picture (the "kinetico-elastic," as the author puts it, with the "kinetico-electric" conception of nature). The latter theory, based on the electron theory, is a step forward in knowledge of the unity of the world; according to this theory the "elements of the material world are electrical charges" (*Ladungen,* p. 223). "Every purely kinetic conception of nature knows nothing save a certain number of moving objects, whether they are called electrons or something else. The state of motion of these objects in successive time intervals is consistently determined by the position and state of their motion in the preceding time interval" (p. 225). The chief defect of Becher's book is his absolute ignorance of dialectical materialism. This ignorance frequently leads him into confusion and absurdity, on which it is impossible to dwell here.

symbols; you have abandoned the absurd, "metaphysical" claims to knowledge of objective reality—well then, be logical and agree with us that science has practical significance only for one sphere of human activity and that religion has *a no less real significance* for another sphere of activity; "symbolic," Machian science has no right to deny theology. H. Poincaré was abashed by these conclusions and in his book *La valeur de la science* made a special attack on them. But just see *what* epistemological position he was obliged to adopt in order to rid himself of allies of the type of Le Roy. He writes: "M. Le Roy regards the intellect as incurably impotent only in order to give greater place to other sources of knowledge, for instance, the heart, sentiment, instinct and faith" (pp. 214-15). "I do not go to the limit," he says. Scientific laws are conventions, symbols, but "...if scientific 'recipes' have a value as rules of action, it is because we know that, in general at least, they are successful. But to know this is already to know something; and if so, how can you say that we can know nothing?" (p. 219).

H. Poincaré resorts to the criterion of practice. But he only shifts the question without settling it; for this criterion may be interpreted in a subjective as well as in an objective way. Le Roy also admits this criterion for science and industry; all he denies is that this criterion proves *objective* truth, for such a denial suffices him for admitting the subjective truth of religion along with the subjective truth of science (*i.e.,* as not existing apart from man). Poincaré realises that one cannot limit oneself to a reference to practice in arguing against Le Roy, and he passes to the question of the objectivity of science. "What is the criterion of its objectivity? Well, it is exactly the same as the criterion of our belief in external objects. These objects are real inasmuch as the sensations they evoke in us *(qu'ils nous font éprouver)* appear to be united by some sort of indestructible cement and not by an ephemeral accident" (pp. 269-70).

The author of such a remark may well be a great *physicist,* but it is absolutely indisputable that only the Voroshilov-Yushkeviches can take him seriously as a philosopher. Materialism is declared to have been destroyed by a "theory" which at the first onslaught of fideism *takes refuge under the wing of materialism*! For it is the purest materialism to say that sensations are evoked in us by real objects and that "belief" in the objectivity of science is the same as "belief" in the objective existence of external objects.

"...It can be said for instance, that ether has no less reality than any external body" (p. 270).

What an outcry our Machians would have raised had a materialist said that! How many feeble witticisms would have been uttered at the expense of "ethereal materialism," and so forth. But five pages later the founder of recent empirio-symbolism declares: "Everything that is not thought is pure nothing, since we can think nothing but thought" (p. 276). You are mistaken, M. Poincaré; your works prove that there are people who can think what is entirely devoid of thought. To this class of people belongs the notorious muddler, Georges Sorel, who maintains that the "first two parts" of Poincaré's book on the value of science are written in the "spirit of Le Roy" and that therefore the two philosophers can be "reconciled" as follows: the attempt to establish an identity between science and the world is an illusion; there is no need to raise the question whether science can have knowledge of nature or not, for it is sufficient that science should correspond with the mechanisms created by us (Georges Sorel, *Les préoccupations metaphysiques des physiciens modernes,* Paris 1907, pp. 77, 80, 81).

But while it is sufficient merely to mention the "philosophy" of Poincaré and pass on, it is imperative to dwell at some length on the work of A. Rey. We have already pointed out that the two basic trends in modern physics, which Rey calls the "conceptualist" and the "neo-mechanistic," reduce themselves to the difference between the idealist and the materialist epistemologies. We must now see how the positivist Rey solves a problem which is diametrically opposed to that broached by the spiritualist James Ward and the idealists Cohen and Hartmann, the problem, namely, not of seizing upon the philosophical mistakes of the new physics, its leanings towards idealism, but of rectifying these mistakes and of proving the illegitimacy of the idealist (and fideist) conclusions drawn from the new physics.

A thread that runs through the whole of Rey's work is the recognition of the fact that the new theory of physics of the "conceptualists" (Machians) has been seized upon by *fideism* (pp. 11, 17, 220, 362, etc.) and *"philosophical idealism"* (p. 200), scepticism as to the rights of the intellect and the rights of science (pp. 210, 220), subjectivism (p. 311), and so forth. Therefore, Rey quite rightly makes the analysis of the "opinions of the physicists on the objective validity of physics" (p. 3) the *centre* of his work.

And what are the results of this analysis?

Let us take the basic concept, the concept of experience. Rey assures us that Mach's subjectivist interpretation (for the sake of simplicity and brevity we shall take Mach as the representative of the school which Rey terms conceptualist) is a sheer misunderstanding. It is true that one of the "outstanding new features of the philosophy of the end of the nineteenth century" is that "empiricism, becoming ever subtler and richer in nuances, leads to fideism, to the supremacy of faith—this same empiricism that was once the great war engine of scepticism against the assertions of metaphysics. Has not at bottom the real meaning of the word 'experience' been distorted, little by little, by imperceptible nuances? Experience, when returned to the conditions of existence, to that experimental science which renders it exact and refined, leads us to necessity and to truth" (p. 398). There is no doubt that all Machism, in the broad sense of the term, is nothing but a distortion, by means of imperceptible nuances, of the real meaning of the word "experience"! But how does Rey, who accuses only the fideists of distortion, but not Mach himself, correct this distortion? Listen. "Experience is by definition a knowledge of the object. In physical science this definition is more in place than anywhere else.... Experience is that over which our mind has no command, that which our desires, our volition, cannot control, that which is given and which is not of our own making. Experience is the object that faces *(en face du)* the subject" (p. 314).

Here you have an example of how Rey defends Machism! What penetrating genius Engels revealed when he dubbed the latest type of adherents of philosophical agnosticism and phenomenalism "shamefaced materialists." The positivist and ardent phenomenalist, Rey, is a superb specimen of this type. If experience is "knowledge of the object," if "experience is the object that faces the subject," if experience means that "something external *(quelque chose du dehors)* exists and necessarily exists" (*se pose et en se posant s'impose*—p. 324), this obviously amounts to materialism! Rey's phenomenalism, his ardent and emphatic assertion that nothing exists save sensations, that the objective is that which is generally valid, etc., etc.—all this is only a fig-leaf, an empty verbal covering for materialism, since we are told:

"The objective is that which is given from without, that which is imposed by experience; it is that which is not of our making, but which is made independently of us and which to a certain extent makes us" (p. 320). Rey defends "conceptualism" by destroying conceptualism! The refutation of the idealist implications of Machism is achieved only by interpreting Machism after the manner of shamefaced materialism. Having himself admitted the distinction between the two trends in modern physics, Rey toils in the sweat of his brow to obliterate all distinctions in the interests of the materialist trend. Rey says of the neo-mechanist school, for instance, that it does not admit the "least doubt, the least uncertainty" as to the objectivity of physics (p. 237): "Here [in regard to the doctrines of this school] one feels remote from the detours one was obliged to make from the standpoint of the other theories of physics in order to arrive at the assertion of this objectivity."

But it is such "detours" of Machism that Rey conceals by casting a veil over them in his exposition. The fundamental characteristic of materialism is that it *starts from* the objectivity of science, from the recognition of objective reality reflected by science, whereas idealism *needs* "detours" in order, in one way or another, to "deduce" objectivity from mind, consciousness, the "psychic." "The neo-mechanist [*i.e.*, the prevailing] school in physics," says Rey, "*believes in the reality* of the physical theory just as humanity *believes in the reality* of the external world" (p. 234, § 22: Thesis). For this school "theory aims at being a copy *(le décalque)* of the object" (p. 235).

True. And this fundamental trait of the "neo-mechanist" school is nothing but the basis of *materialist* epistemology. No attempts of Rey to dissociate himself from the materialists or to assure us that the neo-mechanists are also in essence phenomenalists, etc., can mitigate this basic fact. The essence of the difference between the neo-mechanists (materialists who are more or less shamefaced) and the Machians is that the latter *depart* from this theory of knowledge, and departing from it inevitably *fall* into fideism.

Take Rey's attitude to Mach's theory of causality and necessity in nature. Only at first glance, Rey assures us, does it appear that Mach is "approaching scepticism" and "subjectivism" (p. 76); this "ambiguity" *(équivoque,* p. 115) disappears if Mach's teaching is taken as a whole. And Rey takes it as a whole, quotes a series of passages from the *Wärmelehre* and the *Analyse der Empfindungen*, and specially deals with the chapter on causality in the former book, but ... *he takes care not to quote the decisive passage, Mach's declaration that there is no physical necessity, but only logical necessity*! All that one can say of such a procedure is that it does not interpret Mach but adorns him, that it obliterates the differences between "neo-mechanism" and Machism. Rey's conclusion is that "Mach adopts the conclusions of Hume, Mill and all the phenomenalists, according to whom the causal relation has no *substantiality* and is only a habit of thought. He has also adopted the fundamental thesis of phenomenalism, of which the doctrine of causality is only a consequence, namely, that nothing exists save sensations. But he adds, along a purely objectivist line, that science, analysing sensations, discovers in them certain permanent and common elements which, although abstracted from these sensations, have the same reality as the sensations themselves, for they are taken from sensations by means of perceptual observation. And these permanent and common elements, such as energy and its various forms, are the foundation for the systematisation of physics" (p. 117).

This means that Mach accepts Hume's subjective theory of causality and interprets it in an objectivist sense! Rey is shirking the issue when he defends Mach by referring to his inconsistency, and by maintaining that in the "real" interpretation of experience the latter leads to "necessity." Now, experience is what is given to us from without; and if the necessity of nature and its laws are also given to man from without, from an objectively real nature, then, of course, all difference between Machism and materialism vanishes. Rey defends Machism against the charge of "neo-mechanism" by capitulating to the latter all along the line, retaining the word phenomenalism but not the essence of that trend.

Poincaré, for instance, fully in the spirit of Mach, derives the laws of nature—including even the tri-dimensionality of space—from "convenience." But this does not at all mean "arbitrary," Rey hastens to "correct." Oh no, "convenient" here expresses *"adaptation to the object"* (Rey's italics, p. 196). What a superb differentiation between the two schools and what a superb "refutation" of materialism!... "If Poincaré's theory is logically separated by an impassable gulf from the ontological interpretation of the mechanist school [*i.e.*, from the latter's acceptance of theory as a copy of the object] ... if Poincaré's theory lends itself to the support of philosophical idealism, in the scientific sphere, at least, it agrees very well with the general evolution of the ideas of classical physics and the tendency to regard physics as objective knowledge, as objective as experience, that is, as the sensations from which experience proceeds" (p. 200).

On the one hand, we cannot but admit; on the other hand, it must be confessed. On the one hand, an impassable gulf divides Poincaré from neo-mechanism, although Poincaré stands *in between* Mach's "conceptualism" and neo-mechanism, while Mach it would apear is not separated by any gulf from neo-mechanism; on the other hand, Poincaré is quite compatible with classical physics which, according to Rey himself, completely accepts the standpoint of "mechanism." On the one hand, Poincaré's theory lends itself to the support of philosophical idealism; on the other hand, it is compatible with the objective interpretation of the word experience. On the one hand, these bad fideists have distorted the meaning of the word experience by imperceptible deviations, by departing from the correct view that "experience is the object"; on the other hand, the objectivity of experience means only that experience is sensation ... with which both Berkeley and Fichte agree!

Rey got himself muddled because he had set himself the impossible task of "reconciling" the opposition between the materialist and the idealist schools in the new physics. He seeks to tone down the materialism of the neo-mechanist school, attributing to phenomenalism the views of physicists who regard their theory as a copy of the object.[1] And he

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[1] The "conciliator," A. Rey, not only cast a veil over the formulation of the question at issue as made by philosophical materialism but also ignored the most clearly expressed materialistic declarations of the French physicists. He did not mention, for example, Alfred Cornu, who died in 1902. That physicist met the Ostwaldian "destruction [or conquest, *Ueberwindung*] of scientific materialism" with a contemptuous remark regarding pretentious journalistic treatment of the question (See *Revue générale des sciences*, 1895, pp. 1030-31). At the international congress of physicists held in Paris in 1900, Cornu said: "... The deeper we penetrate into the knowledge of natural phenomena, the more does the bold Cartesian conception of the mechanism of the universe unfold and define itself, namely, that in the physical world there is nothing save matter and motion.

"The problem of the unity of physical forces ... has again come to the fore after the great discoveries which marked the end of this century. Also the constant concern of our modern leaders, Faraday, Maxwell, Hertz (to mention only the illustrious dead), was to define nature more accurately and to unravel the properties of *this elusive matter (matière subtile)*, the receptacle of world energy. ... The reversion to Cartesian ideas is obvious. ..." (*Rapports présentés au congrès international de physique*, Paris, 1900, Vol. IV, p. 7.) Lucien Poincaré, in his book *La physique moderne* (1906), justly remarks that this Cartesian idea was taken up and developed by the Encyclopædists of seeks to tone down the idealism of the conceptualist school by pruning away the more emphatic declarations of its adherents and interpreting the rest in the spirit of shamefaced materialism. How far-fetched and fictitious is Rey's disavowal of materialism is shown, for example, by his opinion of the theoretical significance of the differential equations of Maxwell and Hertz. In the opinion of the Machians, the fact that these physicists limit their theory to a system of equations refutes materialism: there are equations and nothing else—no matter, no objective reality, only symbols. Boltzmann refutes this view, fully aware that he is refuting phenomenalist physics. Rey refutes this view thinking he is defending phenomenalism! He says: We could not refuse to class Maxwell and Hertz among the mechanists "because they limited themselves to equations similar to the differential equations of Lagrange's dynamics." This does not mean that in the opinion of Maxwell and Hertz we shall be unable to build a mechanical theory of electricity out of real elements. Quite the contrary, the fact that we represent electrical phenomena in a theory the form of which is identical with the general form of classical mechanics is proof of the possibility... (p. 253). The indefiniteness of the present solution of the problem "will diminish in proportion as the *nature* of the quantities, *i.e.,* elements, that figure in the equations are more precisely determined." The fact that one or another form of material motion has not yet been investigated is not regarded by Rey as a reason for denying the materiality of motion. "The homogeneity of matter" (p. 262), not as a postulate, but as a result of experience and of the development of science, "the homogeneity of the object of physics"—this is the condition that makes the application of measurement and mathematical calculations possible.

Here is Rey's estimate of the criterion of practice in the theory of knowledge: "Contrary to the propositions of scepti-

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the eighteenth century (p. 14). But neither this physicist nor A. Cornu knew that the dialectical materialists Marx and Engels had freed this fundamental premise of materialism from the one-sidedness of *mechanistic* materialism.

cism, it seems legitimate to say that the practical value of science is derived from its theoretical value" (p. 368). Rey prefers not to speak of the fact that these propositions of scepticism are unequivocally accepted by Mach, Poincaré and their entire school. "They [the practical value and theoretical value of science] are the two inseparable and strictly parallel aspects of its objective value. To say that a law of nature has practical value ... is fundamentally the same as saying that this law of nature has objectivity. To act on the object implies to modify the object; it implies a reaction on the part of the object that conforms to the expectation or anticipation contained in the proposition in virtue of which we acted on the object. Hence, this expectation or anticipation contains elements *controlled* by the object and by the action it undergoes.... In these diverse theories there is thus a part of objectivity" (p. 368). This is a thoroughly materialist, and only materialist, theory of knowledge, for other points of view, and Machism in particular, deny that the criterion of practice has objective significance, *i.e.*, significance that does not depend upon man and mankind.

To sum up, Rey approached the question from an angle entirely different from that of Ward, Cohen, and Co., but he arrived at the same result, namely, the recognition that the materialist and idealist trends form the basis of the division between the two principal schools in modern physics.

7. A RUSSIAN "IDEALIST PHYSICIST"

Owing to certain unfortunate conditions under which I am obliged to work,[1] I have been almost entirely unable to acquaint myself with the Russian literature on the subject under discussion. I shall therefore confine myself to an exposition of an article that has an important bearing on my theme written by our notorious arch-reactionary philosopher, Mr. Lopatin. The article appeared in the September-October issue of *Problems of Philosophy and Psychology*,

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[1] Lenin was at that time living as a political exile abroad.—*Trans*

1907, and is entitled "An Idealist Physicist." A "true-Russian" philosophical idealist, Mr. Lopatin, bears the same relation to the contemporary European idealists as, for example, the "Union of the Russian People"[1] does to the reactionary parties of the West. All the more instructive is it, therefore, to see how similar philosophical trends manifest themselves in totally different cultural and social surroundings. Mr. Lopatin's article is, as the French say, an *éloge*—a eulogy—of the Russian physicist, the late N. I. Shishkin (died 1906). Mr. Lopatin was fascinated by the fact that this cultured man, who was much interested in Hertz and the new physics generally, was not only a Right-wing Constitutional-Democrat (p. 339) but a deeply religious man, a devotee of the philosophy of Vladimir Solovyov, and so on and so forth. However, in spite of the fact that his main line of "endeavour" lies in the borderland between philosophy and the police department, Mr. Lopatin has also furnished certain material for a characterisation of the *epistemological* views of this idealist physicist. Mr. Lopatin writes: "He was a genuine positivist in his tireless endeavour to give the broadest possible criticism of the methods of investigation, suppositions and facts of science from the standpoint of their suitability as means and material for the construction of an integral and perfected world outlook. In this respect N. I. Shishkin was the very antipodes of many of his contemporaries. In previous articles of mine in this periodical, I have frequently endeavoured to explain the heterogeneous and often shaky materials from which the so-called scientific world outlook is made up. They include established facts, more or less bold generalisations, hypotheses that are convenient at the given moment for one or another field of science, and even auxiliary scientific fictions. And all this is elevated to the dignity of incontrovertible objective truths, from the standpoint of which all other ideas and all other beliefs of a philosophical and religious nature must be judged, and everything in them that is not indicated in these truths must be rejected. Our highly talented natural scientist and thinker, Professor V. I. Vernadsky, has shown with exemplary clarity how shallow and unfounded are these claims to convert the scientific views of a given historical period into an immobile, dogmatic system obligatory for all. And it is not only the broad reading public that is guilty of making such a conversion [*footnote by Mr. Lopatin*: "For the broad public a number of popular books have been written, the purpose of which is to foster the conviction that there exists such a scientific catechism providing an answer to all questions. Typical works of this kind are Büchner's *Force and Matter* and Haeckel's *The Riddle of the Universe*"] and not only individual scientists in particular branches of science; what is even more strange is that this sin is frequently committed by the official philosophers, all of whose efforts are at times directed only to proving that they are saying nothing but what has been said before them by representatives of the several sciences, and that they are only saying it in their own language.

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[1] The extreme reactionary organisation formed by the tsarist government in 1905 for the purpose of ruthlessly fighting the revolution.—*Trans.*

"N. I. Shishkin had no trace of prejudiced dogmatism. He was a convinced champion of the mechanical explanation of the phenomena of nature, but for him it was only a method of investigation..." (p. 341). (So, so ... a familiar refrain!) "He was far from believing that the mechanical theory reveals the true nature of the phenomena investigated; he regarded it only as the most convenient and fertile method of unifying and explaining them for the purposes of science. For him, therefore, the mechanical conception of nature and the materialist view of nature by no means coincide." Exactly as in the case of the authors of the *Studies "in" the Philosophy of Marxism*! "Quite the contrary, it seemed to him that in questions of a higher order, the mechanical theory ought to take a very critical, even a conciliatory attitude."

In the language of the Machians this is called "overcoming the obsolete, narrow and one-sided" opposition between materialism and idealism. "Questions of the first beginning and ultimate end of things, of the inner nature of our mind, of the freedom of the will, the immortality of the soul and so forth, cannot in their full breadth of meaning come within its scope—since as a method of investigation it is confined within the natural limits of its applicability solely to the facts of physical experience" (p. 342). The last two lines are an undoubted plagiarism from Bogdanov's *Empirio-Monism.*

"Light can be regarded"—wrote Shishkin in his article "Psycho-Physical Phenomena from the Standpoint of the Mechanical Theory" (*Problems of Philosophy and Psychology,* Bk. 1, p. 127)—"as substance, as motion, as electricity, as sensation."

There is no doubt that Mr. Lopatin is absolutely right in ranking Shishkin among the positivists and that this physicist belonged body and soul to the Machian school of the new physics. In his statement on light, Shishkin means to say that the various methods of regarding light are various methods of "organising experience" (in A. Bogdanov's terminology), all equally legitimate from different points of view, or that they are various "connections of elements" (in Mach's terminology), and that, in any case, the physicists' theory of light is not a copy of objective reality. But Shishkin argues very badly. "Light can be regarded as substance, as motion..." he says. But in nature there is neither substance without motion nor motion without substance. Shishkin's first apposition is meaningless: "as electricity...." Electricity is a movement of substance, hence Shishkin is wrong here too. The electromagnetic theory of light has shown that light and electricity are forms of motion of one and the same substance (ether). "As sensation...." Sensation is an image of matter in motion. Save through sensations, we can know nothing either of the forms of substance or of the forms of motion; sensations are evoked by the action of matter in motion upon our sense-organs. That is how science views it. The sensation of red reflects ether vibrations of a frequency of approximately 450 trillions per second. The sensation of blue reflects ether vibrations of a frequency of approximately 620 trillions per second. The vibrations of the ether exist independently of our sensations of light. Our sensations of light depend on the action of the vibrations of ether on the human organ of vision. Our sensations reflect objective reality, *i.e.*, something that exists independently of humanity and of human sensations. That is how science views it. Shishkin's argument against materialism is the cheapest kind of sophistry.

8. THE ESSENCE AND SIGNIFICANCE OF "PHYSICAL" IDEALISM

We have seen that the question of the epistemological deductions that can be drawn from the new physics has been raised and is being discussed from the most varied points of view in English, German and French literature. There can be no doubt that we have before us a certain international ideological current, which is not dependent upon any one philosophical system, but which is the result of certain general causes lying outside the sphere of philosophy. The foregoing review of the facts undoubtedly shows that Machism is "connected" with the new physics, but at the same time reveals that the version of this connection spread by our Machians is *fundamentally incorrect*. As in philosophy, so in physics, our Machians slavishly follow the *fashion*, and are unable from their own, Marxist, standpoint to give a general survey of particular currents and to judge the place they occupy.

A double falsity pervades all the talk about Mach's philosophy being "the philosophy of twentieth-century natural science," "the recent philosophy of the sciences," "recent natural-scientific positivism" and so forth. (Bogdanov in the introduction to *Analysis of Sensations*, pp. iv, xii; *cf.* also Yushkevich, Valentinov and Co.) Firstly, Machism is ideologically connected with only *one* school in *one* branch of modern science. Secondlv, and *this is the main point*, what in Machism is connected with this school *is not what distinguishes it from all other trends and systems of idealist* *philosophy, but what it has in common with philosophical idealism in general.* It suffices to cast a glance at the ideological current in question *as a whole* in oder to leave no shadow of doubt as to the truth of this statement. Take the physicists of this school: the German Mach, the Frenchman Henri Poincaré, the Belgian P. Duhem, the Englishman Karl Pearson. They have much in common: they have the same basis and are following the same direction, as each of them rightly acknowledges. But what they have in common includes neither the doctrine of empirio-criticism in general, nor Mach's doctrine, say, of the "world-elements" in particular. The three latter physicists even know nothing of either of these doctrines. They have "only" one thing in common—philosophical idealism, towards which they all, without exception, *tend* more or less consciously, more or less decisively. Take the philosophers who base themselves on *this school* of the new physics, who try to ground it epistemologically and to develop it, and you will again find the German immanentists, the disciples of Mach, the French neo-criticists and idealists, the English spiritualists, the Russian Lopatin and, in addition, the one and only empirio-monist, A. Bogdanov. They all have only one thing in common, namely that they all—more or less consciously, more or less decisively, either with an abrupt and precipitate slant towards fideism, or with a personal aversion to it (as in Bogdanov's case)—are vehicles of philosophical idealism.

The fundamental idea of the school of the new physics under discussion is the denial that objective reality is given us in our sensation and reflected in our theories, or the doubt as to the existence of such a reality. Here this school departs from *materialism* (inaccurately called realism, neo-mechanism, hylo-kinetism, and not in any appreciable degree consciously developed by the physicists) which by *general acknowledgement* prevails among the physicists—and departs from it as a school of "physical" idealism.

To explain this last term, which sounds very strange, it is necessary to recall an episode in the history of modern philosophy and modern science. In 1886 L. Feuerbach attacked Johannes Müller, the famous founder of modern physiology, and ranked him with the "physiological idealists" (*Werke,* Vol. X, p. 197). The idealism of this physiologist consisted in the fact that when investigating the significance of the mechanism of our sense-organs in relation to sensations, showing, for instance, that the sensation of light is produced as the result of the action of various stimuli on the eye, he was inclined to arrive from this at a denial that our sensations are images of objective reality. This tendency of one school of scientists towards "physiological idealism," *i.e.*, towards an idealist interpretation of certain data of physiology, was very accurately discerned by L. Feuerbach. The "connection" between physiology and philosophical idealism, chiefly of the Kantian kind, was for a long time after that exploited by reactionary philosophy. F. A. Lange made great play of physiology in support of Kantian idealism and in refutation of materialism; while among the immanentists (whom Bogdanov so incorrectly places midway between Mach and Kant), J. Rehmke in 1882 specially campaigned against the allegation that Kantianism was confirmed by physiology.[1] That a number of eminent physiologists at that time *gravitated* towards idealism and Kantianism is as indisputable as that today a number of eminent physicists *gravitate* towards philosophical idealism. "Physical" idealism, *i.e.*, the idealism of a certain school of physicists at the end of the nineteenth century and the beginning of the twentieth century, no more "refutes" materialism, no more establishes the connection between idealism (or empirio-criticism) and natural science, than did the similar efforts of F. A. Lange and the "physiological" idealists. The deviation towards reactionary philosophy manifested in both cases by one school of scientists in one branch of science is a temporary deflection, a transitory period of sickness in the history of science, an ailment of growth, mainly brought on by the *abrupt breakdown* of old established concepts.

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[1] Johannes Rehmke, *Philosophie und Kantianismus,* Eisenach 1882, p. 15, *et seq.*

The connection between modern "physical" idealism and the crisis of modern physics is, as we have already pointed out, generally acknowledged. "The arguments of sceptical criticism levelled against modern physics"—writes A. Rey, who is referring not so much to the sceptics as to the outspoken adherents of fideism, like Brunetière—"essentially amount to the proverbial argument of all sceptics: a diversity of opinions" (among the physicists). But this diversity "can therefore prove nothing against the objectivity of physics." "In the history of physics, as in history generally, one can distinguish great periods which differ by the form and general aspect of theories.... But as soon as a discovery is made that affects all fields of physics because it establishes some cardinal fact hitherto badly or very partially perceived, the entire aspect of physics is modified; a new period sets in. This is what occurred after Newton's discoveries, and after the discoveries of Joule-Mayer and Carnot-Clausius. The same thing, apparently, is taking place since the discovery of radioactivity.... The historian who later sees things from the necessary distance has no trouble in discerning a steady evolution where contemporaries saw conflicts, contradictions, and divisions into various schools. Apparently, the crisis which physics has undergone in recent years (despite the conclusions drawn from it by philosophical criticism) is no different. It even excellently illustrates the typical crisis of growth *(crise de croissance)* occasioned by the great modern discoveries. The undeniable transformation of physics which will result (could there be evolution or progress without it?) will not perceptibly alter the scientific spirit" (*op. cit.*, pp. 371-72).

Rey the conciliator tries to unite all schools of modern physics against fideism! This is a falsity, well meant, but a falsity nevertheless; for the trend of the school of Mach-Poincaré-Pearson towards idealism (*i.e.*, refined fideism) is beyond dispute. And the objectivity of physics that is associated with the basis of the "scientific spirit," as distinct from the fideist spirit, and that Rey defends so ardently, is nothing but a "shamefaced" formulation of materialism. The basic materialist spirit of physics, as of all modern science, will overcome all crises, but only by the indispensable replacement of metaphysical materialism by dialectical materialism.

Rey the conciliator very often tries to gloss over the fact that the crisis in modern physics consists in the latter's deviation from a direct, resolute and irrevocable recognition of the objective value of its theories. But facts are stronger than all attempts at reconciliation. The mathematicians, writes Rey, ". . in dealing with a science, the subject matter of which, apparently at least, is created by the mind of the scientist, and in which, at any rate, concrete phenomena are not involved in the investigation, have formed too abstract a conception of the science of physics. Attempts have been made to bring it ever closer to mathematics, and the general conception of mathematics has been transferred to the conception of physics. . . . This is an invasion of the mathematical spirit into the methods of judging and understanding physics that is denounced by all the experimenters. And is it not to this influence, none the less powerful because at times concealed, that are often due the uncertainty, the wavering of mind regarding the objectivity of physics, and the detours made or the obstacles surmounted in order to demonstrate it?. . ." (Pp. 226-27.)

This is excellently said. "Wavering of mind" as to the objectivity of physics—this is the very essence of fashionable "physical" idealism.

". . . The abstract fictions of mathematics seem to have interposed a screen between physical reality and the manner in which the mathematicians understand the science of this reality. They vaguely feel the objectivity of physics. . . . Although they desire above all to be objective when they engage in physics; although they seek to find and retain a foothold in reality, they are still haunted by old habits. So that even in the concepts of energetics, which had to be built more solidly and with fewer hypotheses than the old mechanism—which sought to copy *(décalquer)* the sensible universe and not to reconstruct it—we are still dealing with the theories of the mathematicians.... They [the mathematicians] have done everything to save objectivity, for they are aware that without objectivity there can be no physics.... But the complexity or deviousness of their theories nevertheless leaves an uneasy feeling. It is too artificial, too far-fetched, too stilted *(édifié)*; the experimenter here does not feel the spontaneous confidence which constant contact with physical reality gives him.... This in effect is what is said by all physicists who are primarily physicists or who are exclusively physicists—and their name is legion; this is what is said by the entire neo-mechanist school.... The crisis in physics ... lies in the conquest of the realm of physics by the mathematical spirit. The progress of physics on the one hand, and the progress of mathematics on the other, led in the nineteenth century to a close amalgamation between these two sciences.... Theoretical physics has become mathematical physics.... Then there began the formal period, that is to say, the period of mathematical physics, purely mathematical; mathematical physics not as a branch of physics so to speak, but as a branch of mathematics cultivated by the mathematicians. Along this new line the mathematician, accustomed to conceptual (purely logical) elements, which furnish the sole subject matter of his work, and feeling himself cramped by crude, material elements, which he found insufficiently pliable, necessarily always tended to reduce them to abstractions as far as possible, to present them in an entirely non-material and conceptual manner, or even to ignore them altogether. The elements, as real, objective data, as *physical* elements, so to speak, completely disappeared. There remained only formal relations represented by the differential equations.... If the mathematician is not the dupe of his constructive work, when he analyses historical physics ... he can recover its ties with experience and its objective value, but at a first glance, and to the uninitiated person, we seem faced with an arbitrary development.... The concept, the notion, has everywhere replaced the real element.... Thus, historically, by virtue of the mathematical form assumed by theoretical physics, is explained ... the ailment *(le malaise)*, the crisis of physics, and its apparent withdrawal from objective facts" (pp. 227-32).

Such is the first cause of "physical" idealism. The reactionary attempts are engendered by the very progress of science. The great successes achieved by science, the approach to elements of matter so homogeneous and simple that their laws of motion can be treated mathematically, encouraged the mathematicians to overlook matter. "Matter disappears," only equations remain. In the new stage of development and apparently in a new manner, we get the old Kantian idea: reason prescribes laws to nature. Hermann Cohen, who, as we have seen, rejoices over the idealist spirit of the new physics, goes so far as to advocate the introduction of higher mathematics in the schools ... in order to imbue high-school students with the spirit of idealism, which is being extinguished in our materialistic age (F. A. Lange, *Geschichte des Materialismus*, 5. Auflage, 1896, Bd. II, S. xlix). This, of course, is the ridiculous dream of a reactionary and, in fact, there is and can be nothing here but a temporary infatuation with idealism on the part of a small number of specialists. But what is highly characteristic is the way the drowning man clutches at a straw, the subtle means whereby representatives of the educated bourgeoisie artificially attempt to preserve, or to find a place for, the fideism which is engendered among the masses of the people by their ignorance and their down-trodden condition, and by the wild absurdities of capitalist contradictions.

Another cause which bred "physical" idealism is the principle of *relativism*, the relativity of our knowledge, a principle which, in a period of breakdown of the old theories, is taking a firm hold upon the physicists, and which, *in the latter are ignorant of dialectics*, is bound to lead to idealism.

The question of the relation between relativism and dialectics plays perhaps the most important part in explaining the theoretical misadventures of Machism. Take Rey, for instance, who like all European positivists has no conception whatever of Marxian dialectics. He employs the word dialectics exclusively in the sense of idealist philosophical speculation. As a result, although he feels that the new physics has gone astray on the question of relativism, he nevertheless flounders helplessly and attempts to differentiate between moderate and immoderate relativism. Of course, "immoderate relativism ... logically, if not in practice, borders on actual scepticism" (p. 215), but there is no "immoderate" relativism, you see, in Poincaré. Just fancy, one can, like an apothecary, weigh out a little more or a little less relativism and thus save Machism!

As a matter of fact, the only theoretically correct formulation of the question of relativism is given in the dialectical materialism of Marx and Engels, and ignorance of it is *bound* to lead from relativism to philosophical idealism. Incidentally, the failure to understand this fact is enough to render Mr. Berman's absurd book, *Dialectics in the Light of the Modern Theory of Knowledge*, utterly valueless. Mr. Berman repeats the ancient nonsense about dialectics, which he has entirely failed to understand. We have already seen that in the theory of knowledge *all* the Machians, *at every step*, reveal a similar lack of understanding.

All the old truths of physics, including those which were regarded as firmly established and incontestable, have proven to be relative truths—*hence*, there can be no objective truth independent of mankind. Such is the argument not only of the Machians, but of the "physical" idealists in general. That absolute truth results from the sum-total of relative truths in the course of their development; that relative truths represent relatively faithful reflections of an object existing independently of man; that these reflections become more and more faithful; that every scientific truth, notwithstanding its relative nature, contains an element of absolute truth—all these propositions, which are obvious to anyone who has thought over Engels' *Anti-Dühring*, are for the "modern" theory of knowledge a book with seven seals.

Such works as Duhem's *Theory of Physics*,[1] or Stallo's

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[1] P. Duhem, *La théorie physique, son objet et sa structure*, Paris, 1906.

The Concepts and Theories of Modern Physics,[1] which Mach particularly recommends, show very clearly that these "physical" idealists attach the most significance to the proof of the relativity of our knowledge, and that they are in reality vacillating between idealism and dialectical materialism. Both authors, who belong to different periods, and who approach the question from different angles (Duhem's speciality is physics, in which field he has worked for twenty years; Stallo was an erstwhile orthodox Hegelian who grew ashamed of his own book on natural philosophy, written in 1848 in the old Hegelian spirit), energetically combat the atomistic-mechanical conception of nature. They point to the narrowness of this conception, to the impossibility of accepting it as the limit of our knowledge, to the petrification of many of the ideas of writers who hold this conception. And it is indeed undeniable that the *old* materialism did suffer from such a defect; Engels reproached the earlier materialists for their failure to appreciate the relativity of all scientific theories, for their ignorance of dialectics and for their exaggeration of the mechanical point of view. But Engels (unlike Stallo) was able to discard Hegelian idealism and *to grasp* the great and true kernel of Hegelian dialectics. Engels rejected the old metaphysical materialism for *dialectical* materialism, and not for relativism that sinks into subjectivism. "The mechanical theory," says Stallo, for instance, "in common with all metaphysical theories, hypostasises partial, ideal, and, it may be, purely conventional groups of attributes, or single attributes, and treats them as varieties of objective reality" (p. 150). This is quite true, if you do not deny objective reality and combat metaphysics for being anti-dialectical. Stallo does not realise this clearly. He has not understood materialist dialectics and therefore frequently slips, by way of relativism, into subjectivism and idealism.

The same is true of Duhem. With an enormous expenditure of labour, and with the help of a number of interesting and valuable examples from the history of physics, such as one frequently encounters in Mach, he shows that "every law of physics is provisional and relative, because it is approximate" (p. 280). The man is hammering at an open door!—will be the thought of the Marxist when he reads the lengthy disquisitions on this subject. But that is just the trouble with Duhem, Stallo, Mach and Poincaré, that they do not perceive the door opened by dialectical materialism. Being unable to give a correct formulation of relativism, they slide from the latter into idealism. "A law of physics, properly speaking, is neither true nor false, but approximate"—writes Duhem (p. 274). And this "but" contains the beginning of the falsity, the beginning of the obliteration of the boundary between a scientific theory that approximately *reflects the object, i.e.*, approaches objective truth, and an arbitrary, fantastic, and purely conventional theory, such as, for example, a religious theory or the theory of the game of chess.

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[1] J. B. Stallo, *The Concepts and Theories of Modern Physics*, London, 1882.

Duhem carries this falsity to the point of declaring that the question whether "material reality" corresponds to perceptual phenomena is *metaphysics* (p. 10). Away with the question of reality! Our concepts and hypotheses are mere signs (p. 26), "arbitrary" (p. 27) constructions, and so forth. There is only one step from this to idealism, to the "physics of the believer," which M. Pierre Duhem preaches in the Kantian spirit (Rey, p. 162; *cf.*, p. 160). But the good Adler (Fritz)—also a Machian would-be Marxist!—could find nothing cleverer to do than to "correct" Duhem as follows: Duhem, he claims, eliminates the "realities concealed behind phenomena only as objects of theory, but not as *objects of reality*."[1] This is the familiar criticism of Kantianism from the standpoint of Hume and Berkeley.

But, of course, there can be no question of any conscious Kantianism on the part of Duhem. He is merely *vacillating*, as is Mach, not knowing on what to base his relativism. In many passages he comes very close to dialectical materialism. He says that we know sound "such as it is in relation to us but not as it is in itself, in the sound-producing bodies. This reality, of which our sensations give us only the external and the veil, is made known to us by the theories of acoustics. They tell us that where our perceptions register only this appearance which we call sound, there really exists a very small and very rapid periodic movement" (p. 7). Bodies are not symbols of sensations, but sensations are symbols (or rather, images) of bodies. "The development of physics gives rise to a constant struggle between nature, which does not tire of offering new material, and reason, which does not tire of cognising" (p. 32). Nature is infinite, just as its smallest particle (including the electron) is infinite, but reason just as infinitely transforms "things-in-themselves" into "things-for-us." "Thus, the struggle between reality and the laws of physics will continue indefinitely; to every law that physics may formulate, reality will sooner or later oppose a rude refutation in the form of a fact; but, indefatigable, physics will improve, modify, and complicate the refuted law" (p. 290). This would be a quite correct exposition of dialectical materialism if the author firmly held to the existence of this objective reality independent of humanity. "... The theory of physics is not a purely artificial system which is convenient today and unsuitable tomorrow ... it is a classification, which becomes more and more natural, a reflection, which grows clearer and clearer, of the realities that the experimental method cannot contemplate face to face" (p. 445).

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[1] Translator's note to the German translation of Duhem, Leipzig 1908, J. Barth.

In this last phrase the Machian Duhem flirts with Kantian idealism: it is as if the way is being opened for a method other than the "experimental" one, and as if we cannot know the "things-in-themselves" directly, immediately, face to face. But if the theory of physics becomes more and more natural, that means that "nature," reality, "reflected" by this theory, exists independently of our consciousness—and that is precisely the view of dialectical materialism.

In a word, the "physical" idealism of today, just as the "physiological" idealism of yesterday, merely means that one school of natural scientists in one branch of natural science has slid into a reactionary philosophy, being unable to rise directly and at once from metaphysical materialism to dialectical materialism.[1] This step is being made, and will be made, by modern physics; but it is making for the only true method and the only true philosophy of natural science not directly, but by zigzags, not consciously but instinctively, not clearly perceiving its "final goal," but drawing closer to it gropingly, hesitatingly, and sometimes even with its back turned to it. Modern physics is in travail; it is giving birth to dialectical materialism. The process of childbirth is painful. And in addition to a living healthy being, there are bound to be produced certain dead products, refuse fit only for the garbage-heap. And the entire school of "physical idealism," the entire empirio-critical philosophy, together with empirio-symbolism, empirio-monism, and so on, and so forth, must be regarded as such refuse!

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[1] The famous chemist, William Ramsay, says: "I have been frequently asked: 'But is not electricity a vibration? How can wireless telegraphy be explained by the passage of little particles or corpuscles?' The answer is: 'Electricity is a *thing*; it *is* [*Ramsay's italics*] these minute corpuscles, but when they leave an object, a wave, like a wave of light, spreads through the ether, and this wave is used for wireless telegraphy' " (William Ramsay, *Essays, Biographical and Chemical*, London, 1908, p. 126). Having spoken about the transformation of radium into helium, Ramsay remarks: "At least one so-called element can no longer be regarded as ultimate matter, but is itself undergoing change into a simpler form of matter" (pp. 159-60). "Now it is almost certain that negative electricity is a particular form of matter; and positive electricity is matter deprived of negative electricity—that is, minus this electric matter" (p. 176). "Now what is electricity? It used to be believed, formerly, that there were two kinds of electricity, one called positive and the other negative. At that time it would not have been possible to answer the question. But recent researches make it probable that what used to be called negative electricity is really a substance. Indeed the relative weight of its particles has been measured; each is about one seven-hundredth of the mass of an atom of hydrogen.... Atoms of electricity are named 'electrons' " (p. 196). If our Machians who write books and articles on philosophical subjects were capable of thinking, they would understand that the expression "matter disappears," "matter is reduced to electricity," etc., is only an epistemologically helpless expression of the truth that science is able to discover new forms of matter, new forms of material motion, to reduce the old forms to the new forms, and so on.

CHAPTER SIX

EMPIRIO-CRITICISM AND HISTORICAL MATERIALISM

The Russian Machians, as we have already seen, are divided into two camps. Mr. V. Chernov and the collaborators of the *Russkoye Bogatstvo* are downright and consistent opponents of dialectical materialism, both in philosophy and history. The other company of Machians, in whom we are more interested here, are would-be Marxists and try in every way to assure their readers that Machism is compatible with the historical materialism of Marx and Engels. True, these assurances are for the most part nothing but assurances; not a single Machian would-be Marxist has ever made the slightest attempt to present in any systematic way the real trends of the founders of empirio-criticism in the field of the social sciences. We shall dwell briefly on this question, turning first to the statements to be found in writings of the German empirio-criticists and then to those of their Russian disciples.

1. THE EXCURSIONS OF THE GERMAN EMPIRIO-CRITICISTS INTO THE FIELD OF THE SOCIAL SCIENCES

In 1895, when R. Avenarius was still alive, there appeared in the philosophical journal edited by him an article by his disciple, F. Blei, entitled "Metaphysics in Political Economy."[1] All the teachers of empirio-criticism wage war on the "metaphysics" not only of explicit and conscious philosophical materialism, but also of natural science, which instinctively adopts the standpoint of the materialist theory of knowledge. The disciple takes up arms against metaphysics in political economy. The fight is directed against the most varied schools of political economy, but we are interested only in the character of the empirio-critical argument against the school of Marx and Engels.

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[1] *Vierteljahrsschrift für wissenschaftliche Philosophie,* 1895, Bd. XIX, S. 378-90, F. Blei, *"Die Metaphysik in der Nationalökonomie."*

"The purpose of the present investigation," writes Franz Blei, "is to show that all political economy until now, in its endeavour to interpret the phenomena of economic life, operates with metaphysical premises; that it ... 'derives' the 'laws' governing an economy from the 'nature' of the latter, and man is only an incidental factor in relation to these 'laws.' ... In all its theories political economy has hitherto rested on metaphysical grounds; all its theories are unbiological, and therefore unscientific and worthless for knowledge.... The theoreticians do not know what they are building their theories on, what the soil is of which these theories are the fruit. They regard themselves as realists operating without any premises whatever, for they are, forsooth, dealing with 'sober' *(nüchterne)*, 'practical' and 'tangible' *(sinnfällige)* economic phenomena.... And all have that family resemblance to many trends in physiology which only the same parents—*viz.*, metaphysics and speculation—can transmit to their children, in our case to the physiologists and economists. One school of economists analyses the 'phenomena' of 'economy' [Avenarius and his school put ordinary words in quotation marks in order to show that they, the true philosophers, discern the essentially "metaphysical character" of a use of words which is so vulgar and so unrefined by "epistemological analysis"] without placing what they find *(das Gefundene)* in this way into relation with the behaviour of individuals; the physiologists exclude the behaviour of the individual from their investigations as being 'actions of the soul' *('Wirkungen der Seele')*, while the economists of this trend declare the behaviour of individuals to be negligible in relation to the 'immanent laws of economy" (pp. 378-79). With Marx, theory established 'economic laws' from construed processes, and these 'laws' figured in the initial section *(Initialabschnitt)* of the dependent vital series, while the economic processes figured in the final section *(Finalabschnitt)*.... 'Economy' was transformed by the economists into a transcendental category, in which they discovered such 'laws' as they wished to discover: the 'laws' of 'capital' and 'labour,' 'rent,' 'wages' and 'profit.' The economists transformed man into a Platonic idea—'capitalist,' 'worker,' etc. Socialism ascribed to the 'capitalist' the character of being 'greedy for profit,' liberalism ascribed to the worker the character of being 'exacting'—and both characters were moreover explained by the 'operation of the laws of capital'" (pp. 381-82).

"Marx came to the study of French socialism and political economy with a socialist world outlook, and his aim as regards knowledge was to provide a 'theoretical foundation' for his world outlook in order to 'safeguard' his initial value. He found the law of value in Ricardo ... but the conclusion which the French Socialists had drawn from Ricardo could not satisfy Marx in his endeavour to 'safeguard' his E-value brought into a vital-difference, *i.e.*, his 'world outlook,' for these conclusions had already entered as a component part into the content of his initial value in the form of 'indignation at the robbery of the workers,' and so forth. The conclusions were rejected as 'being formally untrue economically' for they are 'simply an application of morality to political economy.' 'But what formally may be economically incorrect, may all the same be correct from the point of view of world history. If the moral consciousness of the mass declares an economic fact to be unjust, that is a proof that the fact itself has been outlived, that other economic facts have made their appearance, owing to which the former one has become unbearable and untenable. Therefore, a very true economic content may be concealed behind the formal economic incorrectness.'" (From Engels' preface to Karl Marx's *The Poverty of Philosophy.)*

Having quoted the above passage from Engels, Blei continues: "In the above quotation the middle section *(Medialabschnitt)* of the dependent series which interests us here is detached [*abgehoben*—a technical term of Avenarius' implying: reached the consciousness, separated off]. After the 'cognition' that an 'economic fact' must be concealed behind the 'moral consciousness of injustice,' comes the final section [*Finalabschnitt:* the theory of Marx is a statement, *i.e.,* an E-value, *i.e.,* a vital-difference which passes through three stages, three sections, initial, middle and final: *Initialabschnitt, Medialabschnitt, Finalabschnitt*]... *i.e.,* the 'cognition' of that 'economic fact.' Or, in other words, the task now is to 'find again' the initial value, his 'world outlook,' in the 'economic facts' in order to 'safeguard' the initial value. This definite variation of the dependent series already contains the Marxian metaphysics, regardless of how the 'cognized' appears in the final section *(Finalabschnitt).* 'The socialist world outlook,' as an independent E-value, 'absolute truth,' is 'given a basis' 'retrospectively' by means of a 'special' theory of knowledge, namely, the economic system of Marx and the materialist theory of history.... By means of the concept of surplus value the 'subjective' 'truth,' in the Marxian world outlook finds its 'objective truth,' in the theory of knowledge of the 'economic categories'—the safeguarding of the initial value is completed and metaphysics has retrospectively received its critique of knowledge" (pp. 384-86).

The reader is probably fuming at us for quoting at such length this incredibly trivial rigmarole, this quasi-scientific tomfoolery decked out in the terminology of Avenarius. But *wer den Feind will verstehen, muß in Feindes Lande gehen*—who would know the *enemy* must go into the *enemy's* territory. And R. Avenarius' philosophical journal is indeed enemy territory for Marxists. And we invite the reader to restrain for a minute his legitimate aversion for the buffoons of bourgeois science and to analyse the argument of Avenarius' disciple and collaborator.

Argument number one: Marx is a "metaphysician" who did not grasp the epistemological "critique of concepts," who did not work out a general theory of knowledge and who simply inserted materialism into his "special theory of knowledge."

This argument contains nothing original to Blei personally. We have already seen scores and hundreds of times that *all* the founders of empirio-criticism and *all* the Russian Machians accuse materialism of "metaphysics," or, more accurately, they repeat the hackneyed arguments of the Kantians, Humeans and idealists against materialist "metaphysics."

Argument number two: Marxism is as "metaphysical" as natural science (physiology). And here again it is not Blei who is "responsible" for this argument, but Mach and Avenarius; for it was they who declared war on "natural-historical metaphysics," applying that name to the instinctively materialist theory of knowledge to which (on their own admission and according to the judgment of all who are in any way versed in the subject) the vast majority of scientists adhere.

Argument number three: Marxism declares that "personality" is a *quantité negligeable,* a cypher, that man is an "incidental factor," subject to certain "immanent laws of economics," that an analysis *des Gefundenen, i.e.,* of what is found, of what is given, etc., is lacking. This argument is a *complete* repetition of the stock of ideas of the empirio-critical "principal co-ordination," *i.e.,* of the *idealist* crotchet in Avenarius' theory. Blei is absolutely right when he says that it is impossible to find the slightest hint of such idealist nonsense in Marx and Engels, and that from the standpoint of this nonsense Marxism must be rejected *completely,* from the very beginning, from its fundamental philosophical premises.

Argument number four: Marx's theory is "unbiological," it is entirely innocent of "vital-differences" and of similar spurious biological terms which constitute the "science" of the reactionary professor, Avenarius. Blei's argument is correct from the standpoint of Machism, for the gulf between Marx's theory and Avenarius' "biological" spillikins is indeed obvious at once. We shall presently see how the Russian Machian would-be Marxists in effect followed in Blei's footsteps

Argument number five: the partisanship, the partiality of Marx's theory and his preconceived solution. The empirio-criticists *as a whole,* and not Blei alone, claim to be non-partisan both in philosophy and in social science. They are neither for socialism nor for liberalism. They make no differentiation between the fundamental and irreconcilable trends of materialism and idealism in philosophy, but endeavour to *rise above* them. We have traced this tendency of Machism through a long series of problems of epistemology, and we ought not to be surprised when we encounter it in sociology.

"Argument" number six: ridiculing "objective" truth. Blei at once sensed, and rightly sensed, that historical materialism and Marx's entire economic doctrine are permeated through and through by a recognition of objective truth. And Blei accurately expressed the tendency of Mach's and Avenarius' doctrines, when, precisely because of the idea of objective truth, he, "from the very threshold," so to speak, rejected Marxism by at once declaring that there was absolutely nothing behind the Marxist teaching save the "subjective" views of Marx.

And if our Machians renounce Blei (as they surely will), we shall tell them: You must not blame the mirror for showing a crooked face. Blei is a mirror which *accurately* reflects the fundamental tendencies of empirio-criticism, and a renouncement by our Machians would only bear witness to their good intentions—and to their absurd eclectical endeavours to combine Marx and Avenarius.

Let us pass from Blei to Petzoldt. If the former is a mere disciple, the latter is declared by outstanding empirio-criticists, such as Lessevich, to be a master. While Blei brings up the question of Marxism explicitly, Petzoldt—who would not demean himself by dealing with a mere Marx or a mere Engels—sets forth in positive form the views of empirio-criticism on sociology, which enables us to compare them with Marxism.

The second volume of Petzoldt's *Einführung in die Philosophie der reinen Erfahrung* is entitled *"Auf dem Wege* *zum Dauernden*" ("Towards Stability"). The author makes the tendency towards stability the basis of his investigation. "The main features of the ultimate *(endgültige)* state of stability of humanity can be inferred in its formal aspect. We thus arrive at the foundations of ethics, æsthetics and the formal theory of knowledge" (p. iii). "Human development bears its goal within itself, it also tends towards a perfect *(vollkommene)* state of stability" (p. 60). The signs of this are abundant and varied. For instance, are there many violent radicals who do not in their old age become "more sensible," more restrained? True, this "premature stability" (p. 62) is characteristic of the philistine. But do not philistines constitute the "compact majority"? (P. 62.)

Our philosopher's conclusion, which he gives in italics, is this: "The quintessential feature of all the aims of our reasoning and creative activity is stability" (p. 72). The explanation is: "Many cannot bear to see a key lying obliquely on the table, still less a picture hanging crooked on the wall.... And such people are not necessarily pedants.... It is only that they have *a feeling that something is not in order*" (p. 72, Petzoldt's italics). In a word, the "tendency to stability is a striving for an extreme, by its nature ultimate, state" (p. 73). All this is taken from the fifth chapter of Volume II entitled "*Die psychische Tendenz zur Stabilität*" ("The Psychical Tendency to Stability"). The proofs of this tendency are all very weighty. For instance: "A striving for an extreme, a highest, in the original spatial sense, is pursued by the majority of mountain climbers. It is not always the desire for a spacious view or joy in the physical exercise of climbing in fresh air and wide nature that urges them towards the peaks, but also the instinct which is deeply ingrained in every organic being to pursue an adopted path of activity until a natural aim has been achieved" (p. 73). Another example: the amount of money people will pay to secure a complete collection of postage stamps! "It makes one's head swim to examine the price list of a dealer in postage stamps.... And yet nothing is more natural and comprehensible than this urge for stability" (p. 74).

The philosophically untutored can have no conception of the breadth of the principles of stability and of economy of thought. Petzoldt develops his "theory" in detail for the profane. "Sympathy is an expression of the immediate need for a state of stability," runs § 28. "Sympathy is not a repetition, a duplication of the observed suffering, but suffering on account of this suffering.... The greatest emphasis must be placed on the immediacy of sympathy. If we admit this we thereby admit that the welfare of others can concern a man just as immediately and fundamentally as his own welfare, and we thus at the same time reject every utilitarian and eudemonistic foundation of ethics. Thanks to its longing for stability and peace, human nature is not fundamentally evil, but anxious to help....

"The immediacy of sympathy is frequently manifested in the immediacy of help. The rescuer will often fling himself without thought to save a drowning man. He cannot bear the sight of a person struggling with death; he forgets his other duties and risks his own life and the life of his near ones in order to save the useless life of some degraded drunkard; in other words, under certain circumstances sympathy can drive one to actions that are morally unjustifiable."

And scores and hundreds of pages of empirio-critical philosophy are filled with such unutterable platitudes!

Morality is deduced from the concept "moral state of stability." (The second section of Volume II: *"Die Dauerbestände der Seele"* ["Stable States of the Soul"], Chapter 1, *"Vom ethischen Dauerbestände"* ["On Ethical Stable States"]) "The state of stability, according to the very concept of it, contains no conditions of change in any of its components. From this it at once follows that it can contain no possibility of *war*..." (p. 202). "Economic and social equality is implied in the conception of the final *(endgültig)*, stable state" (p. 213). This "state of stability" is derived not from religion but from "science." The "majority" cannot bring it about, as the socialists suppose, nor can the power of the socialists "help humanity" (p. 207). Oh, no!—it is "free development" that will lead to the ideal. Are not, indeed, the profits of capital decreasing and are not wages constantly increasing? (p. 223). All the assertions about "wage slavery" are untrue (p. 229). A slave's leg could be broken with impunity—but now? No, "moral progress" is beyond doubt; look at the university settlements in England, at the Salvation Army (p. 230), at the German "ethical societies." In the name of "æsthetic stability" (chapter II, section 2) "romanticism" is rejected. But romanticism embraces all forms of inordinate extension of the ego, idealism, metaphysics, occultism, solipsism, egoism, the "forcible coercion of the minority by the majority" and the "social-democratic ideal of the organisation of all labour by the state" (pp. 240-41).[1]

The sociological excursions of Blei, Petzoldt and Mach are but an expression of the infinite stupidity of the philistine, smugly retailing the most hackneyed rubbish under cover of a new "empirio-critical" systematisation and terminology. A pretentious cloak of verbal artifices, clumsy devices in syllogistic, subtle scholasticism, in a word, as in epistemology, so in sociology—the same reactionary content under the same flamboyant signboard.

Let us now turn to the Russian Machians.

2. HOW BOGDANOV CORRECTS AND "DEVELOPS" MARX

In his article "The Development of Life in Nature and Society" (*From the Psychology of Society*, 1902, p. 35, *et seq.)*, Bogdanov quotes the well-known passage from the preface to the *Critique of Political Economy,* where the "great sociologist," *i.e.*, Marx, expounds the principles of historical materialism. Having quoted Marx's words, Bogdanov declares that the "old formulation of historical monism, without ceasing to be basically true, no longer fully satisfies us" (p. 37). The author wishes, therefore, to correct the theory, or to develop it, *starting, however, from the foundations of the theory.* The author's chief conclusion is as follows:

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[1] It is in the same spirit that Mach expresses himself in favour of the bureaucratic socialism of Popper and Menger, which guarantees the "freedom of the individual," whereas, he opines, the doctrine of the Social-Democrats, which "compares unfavourably" with this socialism, threatens a "slavery even more universal and more oppressive than that of a monarchical or oligarchical state." See *Erkenntnis und Irrtum*, 2. Auflage, 1906, S. 80-81.

"We have shown that social forms belong to the comprehensive *genus*—biological adaptations. But we have not thereby defined the province of social forms; for a definition, not only the *genus,* but also the *species* must be established.... In their struggle for existence men can unite only with the help of *consciousness*: without consciousness there can be no intercourse. Hence, *social life in all its manifestations is a consciously psychical life....* Society is inseparable from consciousness. *Social being and social consciousness are, in the exact meaning of these terms, identical*" (pp. 50, 51, Bogdanov's italics).

That this conclusion is absolutely alien to Marxism has been pointed out by Orthodox (*Philosophical Essays,* St. Petersburg, 1906, p. 183). But Bogdanov responded simply by abuse, picking upon an *error* in quotation: instead of "in the exact meaning of these terms," Orthodox had quoted "in the full meaning of these terms." This error was indeed committed, and the author had every right to correct it; but to raise a cry of "mutilation," "substitution," and so forth (*Empirio-Monism,* Book III, p. xliv), is simply to *obscure* the essence of the point at issue by wretched words. Whatever "exact" meaning Bogdanov may have invented for the terms "social being" and "social consciousness," there can be no doubt that the statement we have quoted is *not correct.* "Social being" and "social consciousness" are not identical, just as being in general and consciousness in general are not identical. From the fact that in their intercourse men act as conscious beings, it *does not follow* that social consciousness is identical with social being. In all social formations of any complexity—and in the capitalist social formation in particular—people in their intercourse are *not conscious* of what kind of social relations are being formed, in accordance with what laws they develop, etc. For instance, a peasant when he sells his grain enters into "intercourse" with the world producers of grain in the world market, but he is not conscious of it; nor is he conscious of the kind of social relations that are formed on the basis of exchange. Social consciousness *reflects* social being—that is Marx's teaching. A reflection may be an approximately true copy of the reflected, but to speak of identity is absurd. Consciousness in general *reflects* being—that is a general principle of *all* materialism. It is impossible not to see its direct and *inseparable* connection with the principle of historical materialism: social consciousness *reflects* social being.

Bogdanov's attempt imperceptibly to correct and develop Marx in the "spirit of his principles" is an obvious distortion of these *materialist* principles in the spirit of *idealism.* It would be ludicrous to deny it. Let us recall Bazarov's exposition of empirio-criticism (not empirio-monism, oh no!—there is such a wide, wide difference between these "systems"!): "sense-perception *is* the reality existing outside us." This is plain idealism, a plain theory of the identity of consciousness and being. Recall, further, the formulation of W. Schuppe, the immanentist (who swore and vowed as fervently as Bazarov and Co. that he was not an idealist, and who with no less vigour than Bogdanov insisted on the very "exact" meaning of his terms): "being is consciousness." Now compare this with the *refutation* of Marx's historical materialism by the immanentist Schubert-Soldern: "Every material process of production is always an act of consciousness on the part of its observer.... In its epistemological aspect, it is not the external process of production that is the *primary (prius),* but the subject or subjects; in other words, even the purely material process of production does not lead us out of the general connection of consciousness

(Bewußtseinszusammenhang)." (See *Das menschliche Glück und die soziale Frage,* S. 293, 295-96.)

Bogdanov may curse the materialists as much as he pleases for "mutilating his thoughts," but no curses will alter the simple and plain fact. The correction of Marx's theory and the development of Marx supposedly in the spirit of Marx by the "empirio-monist" Bogdanov *in no essential respect* differ from the way the idealist and epistemological solipsist Schubert-Soldern endeavours to refute Marx. Bogdanov assures us that he is not an idealist. Schubert-Soldern assures us that he is a realist (Bazarov even believed him). In our time a philosopher has to declare himself a "realist" and an "enemy of idealism." It is about time you understood this, Messrs. Machians!

The immanentists, the empirio-criticists and the empirio-monist all argue over particulars, over details, over the formulation of *idealism,* whereas we *from the very outset* reject all the principles of their philosophy common to this trinity. Let Bogdanov, accepting in the best sense and with the best of intentions *all the conclusions* of Marx, preach the "identity" of social being and social consciousness; we shall say: Bogdanov *minus* "empirio-monism" (or rather, *minus* Machism) is a Marxist. For this theory of the identity of social being and social consciousness is *sheer nonsense* and an *absolutely reactionary* theory. If certain people reconcile it with Marxism, with Marxist behaviour, we must admit that these people are better than their theory, but we cannot justify outrageous theoretical distortions of Marxism.

Bogdanov reconciles his theory with Marx's conclusions, and sacrifices elementary consistency for the sake of these conclusions. Every individual producer in the world economic system realises that he is introducing a certain change into the technique of production; every owner realises that he exchanges certain products for others; but these producers and these owners do not realise that in doing so they are thereby changing *social being.* The sum total of these changes in all their ramifications in the capitalist world economy could not be grasped even by seventy Marxes. The paramount thing is that the *laws* of these changes have been discovered, that the *objective* logic of these changes and their historical development have at bottom and in the main been disclosed—objective, not in the sense that a society of conscious beings, men, could exist and develop independently of the existence of conscious beings (and it is only such trifles that Bogdanov *stresses* by his "theory"), but in the sense that social being is *independent of the social consciousness of men.* The fact that you live and conduct your business, beget children, produce products and exchange them, gives rise to an objectively necessary chain of events, a chain of development, which is independent of your *social* consciousness, and is never grasped by the latter completely. The highest task of humanity is to comprehend the objective logic of economic evolution (the evolution of social life) in its general and fundamental features, so that it may be possible to adapt *to it* one's social consciousness and the consciousness of the advanced classes of all capitalist countries in as definite, clear and critical a fashion as possible.

Bogdanov admits all this. And what does this mean? It means in *effect* that his theory of the "identity of social being and social consciousness" is thrown overboard, that it becomes an empty scholastic appendage, as empty, dead and useless as the "theory of general substitution" or the doctrine of "elements," "introjection" and the rest of the Machian rigmarole. But the "dead lay hold of the living"; the dead scholastic appendage, *in spite of and independently of the consciousness* of Bogdanov, converts his philosophy into a *serviceable tool* of the Schubert-Solderns and other reactionaries, who in a thousand different keys, from a hundred professorial chairs, disseminate *this* dead thing as a living thing, direct it against the living thing, for the purpose of stifling it. Bogdanov personally is a sworn enemy of reaction in general and of bourgeois reaction in particular. Bogdanov's "substitution" and theory of the "identity of social being and social consciousness" *serve* this reaction. It is sad, but true.

Materialism in general recognises objectively real being (matter) as independent of the consciousness, sensation, experience, etc., of humanity. Historical materialism recognises social being as independent of the social consciousness of humanity. In both cases consciousness is only the reflection of being, at best an approximately true (adequate, perfectly exact) reflection of it. From this Marxian philosophy, which is cast from a single piece of steel, you cannot eliminate one basic premise, one essential part, without departing from objective truth, without falling a prey to a bourgeois-reactionary falsehood.

Here are further examples of how the dead philosophy of idealism lays hold of the living Marxist Bogdanov.

The article "What Is Idealism?" 1901 (*ibid.*, p. 11 *et seq.*)*:* "We arrive at the following conclusion: both where people agree in their judgments of progress and where they disagree, the basic meaning of the idea of progress is the same, namely, *increasing completeness and harmony of conscious life.* This is the objective content of the concept progress.... If we now compare the psychological formulation of the idea of progress thus arrived at with the previously explained biological formulation ["the biological progress is an *increase in the sum-total of life,*" p. 14], we shall easily convince ourselves that the former fully coincides with the latter and can be deduced from it.... And since social life amounts to the psychical life of members of society, here too the content of the idea of progress is the same—the increase in the completeness and harmony of life; only we must add: the *social* life of men. And, of course, the idea of social progress never had and cannot have any other content" (p. 16).

"We have found ... that idealism expresses the victory in the human soul of moods more social over moods less social, that a progressive ideal is a reflection of the socially progressive tendency in the idealist psychology" (p. 32).

It need hardly be said that all this play with biology and sociology contains *not a grain* of Marxism. Both in Spencer and Mikhailovsky one may find any number of definitions not a whit worse than this, defining nothing but the "good intentions" of the author and betraying a *complete lack of understanding* of "what is idealism" and what materialism.

The author begins Book III of *Empirio-Monism,* the article "Social Selection (Foundations of Method)," 1906, by refuting the "eclectic socio-biological attempts of Lange, Ferri, Woltmann and many others" (p. 1), and on page 15 we find the following conclusion of the "enquiry": "We can formulate the fundamental connection between energetics and social selection as follows:

"*Every act of social selection represents an increase or decrease of the energy of the social complex concerned. In the former case we have 'positive selection,' in the latter 'negative selection.'*" (Author's italics.)

And such unutterable trash is served out as Marxism! Can one imagine anything more sterile, lifeless and scholastic than this string of biological and energeticist terms that contribute nothing, and can contribute nothing, in the sphere of the social sciences? There is not a shadow of concrete economic enquiry here, not a hint of the Marxian *method,* the method of dialectics and the world outlook of materialism, only a mere *invention* of definitions and attempts to fit them into the ready-made conclusions of Marxism. "The rapid growth of the productive forces of capitalist society is undoubtedly an increase in the energy of the social whole...." The second half of the phrase is undoubtedly a simple repetition of the first half expressed in meaningless terms which seem to lend "profundity" to the question, but which in reality *in no way* differ from the eclectic biologico-sociological attempts of Lange and Co.! "...but the disharmonious character of this process leads to its culmination in a 'crisis,' in a vast waste of productive forces, in a sharp decrease of energy: 'positive selection' is replaced by 'negative selection'" (p. 18).

In what way does this differ from Lange? A biologico-energeticist label is tacked on to ready-made conclusions on the subject of crises, without any concrete material whatever being added and without the nature of crises being elucidated. All this is done with the very best intentions, for the author wishes to corroborate and give greater depth to Marx's conclusions; but in point of fact he only *dilutes* them with an intolerably dreary and lifeless scholasticism. The only "Marxism" here is a *repetition* of an already known conclusion, and all the "new" proof of it, all this *"social energetics"* (p. 34) and "social selection" is but a mere *collection of words* and a sheer mockery of Marxism.

Bogdanov is not engaged in a Marxian enquiry at all; all he is doing is to reclothe results already obtained by the Marxian enquiry in a biological and energeticist terminology. The whole attempt is worthless from beginning to end, for the concepts "selection," "assimilation and dissimilation" of energy, the energetic balance, and so forth, are, when applied to the sphere of the social sciences, but *empty phrases.* In fact, an *enquiry* into social phenomena and an elucidation of the *method* of the social sciences *cannot* be undertaken with the aid of these concepts. Nothing is easier than to tack the labels of "energetics" or "biologico-sociology" on to such phenomena as crises, revolutions, the class struggle and so forth; but neither is there anything more sterile, more scholastic and lifeless than such an occupation. The important thing is not that Bogdanov tries to fit *all* his results and conclusions into the Marxian theory—or "nearly" all (we have seen the "correction" he made on the subject of the relation of social being to social consciousness)—but that the *methods* of fitting—this "social energetics"—are thoroughly false and in no way differ from the methods of Lange.

"Herr Lange (*Ueber die Arbeiterfrage usw.* 2. Auflage)," Marx wrote to Kugelmann on June 27, 1870, "sings my praises loudly, but with the object of making himself important. Herr Lange, you see, has made a great discovery. The whole of history can be brought under a single great natural law. This natural law is the *phrase* (in this application Darwin's expression becomes nothing but a phrase) 'the struggle for life,' and the content of this phrase is the Malthusian law of population, or, rather, over-population. So, instead of analysing the struggle for life as represented historically in varying and definite forms of society, all that has to be done is to translate every concrete struggle into the phrase 'struggle for life,' and this phrase itself into the Malthusian population fantasy. One must admit that this is a very impressive method—for swaggering, sham-scientific, bombastic ignorance and intellectual laziness."[1]

The basis of Marx's criticism of Lange is not that Lange foists Malthusianism in particular upon sociology, but that the transfer of biological concepts *in general* to the sphere of the social sciences is a *phrase*. Whether the transfer is undertaken with "good" intentions, or with the purpose of bolstering up false sociological conclusions, the phrase none the less remains a phrase. And Bogdanov's "social energetics," his coupling of the doctrine of social selection with Marxism, is just such a phrase.

Just as in epistemology Mach and Avenarius did not develop idealism, but only overlaid the *old* idealist errors with a bombastic terminological rigmarole ("elements," "principal co-ordination," "introjection," etc.), so in sociology, even when there is sincere sympathy for Marxist conclusions, empirio-criticism results in a distortion of historical materialism by means of empty and bombastic energeticist and biological verbiage.

A historical peculiarity of modern Russian Machism (or rather of the Machian epidemic among a section of the Social-Democrats) is the following. Feuerbach was a "materialist below and an idealist above"; this to a certain extent applies also to Büchner, Vogt, Moleschott and Dühring, with the essential difference that all these philosophers were pygmies and wretched bunglers compared with Feuerbach.

Marx and Engels, as they grew out of Feuerbach and matured in the fight against the bunglers, naturally paid most attention to crowning the structure of philosophical materialism, that is, not to the materialist epistemology but to the materialist conception of history. That is why Marx and Engels laid the emphasis in their works rather on *dialectical* materialism than on dialectical *materialism*, why they insisted rather on *historical* materialism than on historical *materialism*. Our would-be Marxist Machians approached Marxism in an entirely different historical period, at a time when bourgeois philosophers were particularly specialising in epistemology, and having assimilated in a one-sided and mutilated form certain of the component parts of dialectics (relativism, for instance) directed their attention chiefly to a defence or restoration of idealism below and not of idealism above. At any rate, positivism in general, and Machism in particular, have been much more concerned with subtly falsifying epistemology, assuming the guise of materialism and concealing their idealism under a pseudo-materialist terminology, and have paid comparatively little attention to the philosophy of history. Our Machians did not understand Marxism because they happened to approach it *from the other side,* so to speak, and they have assimilated—and at times not so much assimilated as learnt by rote—Marx's economic and historical theory, without clearly apprehending its foundation, *viz.*, philosophical materialism. And the result is that Bogdanov and Co. deserve to be called Russian Büchners and Dührings turned inside out. They want to be materialists above, but are unable to rid themselves of muddled idealism below! In the case of Bogdanov, "above" there is historical materialism, vulgarised, it is true, and much corrupted by idealism, "below" there is idealism, disguised in Marxist terminology and decked out in Marxist words. "Socially organised experience," "collective labour process," and so forth are Marxist words, but they are *only words,* concealing an idealist philosophy that declares things to be complexes of "elements," of sensations, the external world to be "experience," or an "empirio-symbol" of mankind, physical nature to be a "product" of the "psychical," and so on and so forth.

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[1] See English translation of the *Letters to Dr. Kugelmann*, 1934, p. 111.— *Trans.*

An ever subtler falsification of Marxism, an ever subtler presentation of anti-materialist doctrines under the guise of Marxism—this is the characteristic feature of modern revisionism in political economy, in questions of tactics and in philosophy generally, both in epistemology and in sociology.

3. SUVOROV'S "FOUNDATIONS OF SOCIAL PHILOSOPHY"

The *Studies "in" the Philosophy of Marxism,* the concluding article in which is the one by Comrade S. Suvorov mentioned above, by very reason of the collective nature of the book constitutes an unusually potent bouquet. When you have at one time and side by side the utterances of Bazarov, who says that according to Engels "sense-perception is the reality existing outside us," of Berman, who declares the dialectics of Marx and Engels to be mysticism, of Lunacharsky, who goes to the length of religion, of Yushkevich, who introduces "the Logos into the irrational stream of experience," of Bogdanov, who calls idealism the philosophy of Marxism, of Helfond, who purges J. Dietzgen of materialism, and lastly, of S. Suvorov with his article "Foundations of Social Philosophy"—you at once get the "aroma" of the new alignment. Quantity has passed into quality. The "seekers," who had heretofore been seeking separately in individual articles and books, have come out with a veritable pronunciamento. Individual disagreements among them are obliterated by the very fact of their collective appearance *against* (and not "in") the philosophy of Marxism, and the reactionary features of Machism as a current become manifest.

Under these circumstances, Suvorov's article is all the more interesting for the fact that the author is neither an empirio-monist nor an empirio-criticist, but simply a "realist." What relates him, therefore, to the rest of the company is not what distinguishes Bazarov, Yushkevich and Bogdanov as philosophers, but what they all have in common *against* dialectical materialism. A comparison of the sociological arguments of this "realist" with the arguments of the empirio-monist will help us to depict their *common* tendency.

Suvorov writes: "In the gradation of the laws that regulate the world process, the particular and complex become reduced to the general and simple, and all of them are subordinate to the universal law of development—*the law of the economy of forces*. The essence of this law is that a *system of forces is the more capable of conservation and development the less its expenditure, the greater its accumulation and the more effectively expenditure aids accumulation.* The forms of mobile equilibrium, which long ago evoked the idea of objective expediency (the solar system, the cycle of terrestrial phenomena, the process of life), arise and develop by virtue of the conservation and accumulation of the energy inherent in them—by virtue of their intrinsic economy. The law of economy of forces is the unifying and regulating principle of all development—inorganic, biological and social" (p. 293, author's italics).

With what remarkable ease do our "positivists" and "realists" turn out "universal laws"! What a pity these laws are no whit better than those turned out so easily and swiftly by Eugen Dühring. Suvorov's "universal law" is just as empty and bombastic a phrase as Dühring's universal laws. Try to apply this law to the first of the three fields mentioned by the author—inorganic development. You will see that no "economy of forces" *apart from* the law of the conservation and transformation of energy can be applied here, let alone applied "universally." And the author had already disposed of the law of the "conservation of energy," had already mentioned it (p. 292) as a separate law.[1] What then remained in the field of inorganic development apart from this law? Where are the additions or complications, or new discoveries, or new facts which entitled the author to modify ("perfect") the law of the conservation and transformation of energy into the law of the *"economy of forces"*? There are no such facts or discoveries; Suvorov does not even hint at them. He simply—to make it look impressive, as Turgenev's Bazarov[1] used to say—flourished his pen and forth came a new "universal law" of "real-monistic philosophy" (p. 292). That's the stuff we are made of! How are we worse than Dühring?

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[1] It is characteristic that Suvorov calls the discovery of the law of the conservation and transformation of energy "the establishment of the basic principles of *energetics*" (p. 292). Has our would-be Marxist "realist" ever heard of the fact that the vulgar materialists, Büchner and Co., and the dialectical materialist, Engels, regarded this law as the establishment of the basic principles of *materialism*? Has our "realist" ever reflected on the meaning of this difference? He has not; he has merely followed the fashion, repeated Ostwald, and that is all. That is just the trouble: "realists" like this succumb to fashion, while Engels, for instance, *assimilated the, to him, new term*, energy, and began to employ it in 1885 (Preface to the 2nd ed. of *Anti-Dühring*)

Take the second field of development—the biological. In this field, where the development of organisms takes place by the struggle for existence and selection, is it the law of the economy of forces or the "law" of the wastage of forces that is universal? But never mind! "Real-monistic philosophy" can interpret the *"meaning"* of a universal law in one field in one way and in another field in another way, for instance, as the development of *higher* organisms from lower. What does it matter if the universal law is thus transformed into an empty phrase—the principle of "monism" is preserved. And in the third field (the social), the "universal law" can be interpreted in a third sense—as the development of productive forces. That is why it is a "universal law"—so that it can be made to cover anything you please.

"Although social science is still young, it already possesses both a solid foundation and definite generalisations; in the nineteenth century it reached a theoretical level—and this constitutes Marx's chief merit. He elevated social science to the level of a social theory [Engels said that Marx transformed socialism from a utopia into a science, but this is not enough for Suvorov. It will sound more impressive if

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and in 1888 *(Ludwig Feuerbach)*, but to employ it equally with the concepts "force" and "motion" and along with them. Engels was able to enrich his *materialism* by adopting a new terminology. The "realists" and other muddleheads seized upon the new term without noticing the difference between materialism and energetics!

[1] In *Fathers and Sons.—Trans.*

we *distinguish theory from science* (was there a social science before Marx?)—and no harm is done if the distinction is absurd!].

"... by establishing the fundamental law of social dynamics according to which the evolution of productive forces is the determining principle of all economic and social development. But the development of productive forces corresponds to the growth of the productivity of labour, to the relative reduction in expenditure and the increase in the accumulation of energy [see how fertile the "real-monistic philosophy" is: a new, energeticist, foundation for Marxism has been created!] ... this is the economic principle. Thus, Marx made the principle of the economy of forces the foundation of the social theory...."

This "thus" is truly superb! *Because* Marx has a political economy, let us *therefore* chew the *word* "economy," and call the cud "real-monistic philosophy"!

No, Marx did not make any principle of the economy of forces the basis of his theory. These are absurdities invented by people who covet the laurels of Eugen Dühring. Marx gave an absolutely precise definition of the concept "growth of productive forces," and he studied the concrete process of this growth. But Suvorov invented a new word to designate the concept analysed by Marx; and his invention was a very unhappy one and only confused matters. For Suvorov did not explain what is meant by the "economy of forces," how it can be measured, how this concept can be applied, what precise and definite facts it embraces;—and this cannot be explained, because it is a muddle. Listen to this:

"... This law of social economy is not only the principle of the internal unity of social science [can you make anything of this, reader?], but also the connecting link between social theory and the general theory of being" (p. 294).

Well, well, here we have "the general theory of being" once more discovered by S. Suvorov, after it has already been discovered many times and in the most varied forms by numerous representatives of scholastic philosophy. We congratulate the Russian Machians on this new "general theory of being"! Let us hope that their next collective work will be entirely devoted to the demonstration and development of this great discovery!

The way our representative of realistic, or real-monistic, philosophy expounds Marx's theory will be seen from the following example: "In general, the productive forces of men form a genetic gradation [ugh!] and consist of their labour energy, harnessed elemental forces, culturally modified nature and the instruments of labour which make up the technique of production.... In relation to the process of labour these forces perform a purely economic function; they economise labour energy and increase the productivity of its expenditure" (p. 298). Productive forces perform an economic function in relation to the process of labour! This is just as though one were to say that vital forces perform a vital function in relation to the process of life. This is not expounding Marx; this is clogging up Marxism with an incredible clutter of words.

It is impossible to enumerate all the clutter contained in Suvorov's article. "The socialisation of a class is expressed in the growth of its collective power over both people and their property" (p. 313). "...The class struggle aims at establishing forms of equilibrium between social forces" (p. 322). Social dissension, enmity and struggle are essentially negative, anti-social phenomena. "Social progress, in its basic content, is the growth of social relations, of the social connections between people" (p. 328). One could fill volumes with collections of such banalities—and the representatives of bourgeois sociology are filling volumes with them. But to pass them off as the philosophy of Marxism—that is going too far! If Suvorov's article were an experiment in popularising Marxism, one would not judge it very severely. Everyone would admit that the author's intentions were of the best but that the experiment was unsuccessful. And that would be the end of it. But when a group of Machians present us with such stuff and call it the *Foundations of Social Philosophy*, and when we see the same methods of "developing" Marxism employed in Bogdanov's philosophical books, we arrive at the inevitable conclusion that there is an intimate connection between reactionary epistemology and reactionary efforts in sociology.

4. PARTIES IN PHILOSOPHY AND PHILOSOPHICAL BLOCKHEADS

It remains for us to examine the relation between Machism and religion. But this broadens into the question of whether there are parties generally in philosophy, and what is meant by non-partisanship in philosophy.

Throughout the preceding exposition, in connection with every problem of epistemology touched upon and in connection with every philosophical question raised by the new physics, we traced the struggle between *materialism* and *idealism*. Behind the mass of new terminological devices, behind the litter of erudite scholasticism, we invariably discerned *two* principal alignments, two fundamental trends in the solution of philosophical problems. Whether nature, matter, the physical, the external world be taken as primary, and mind, spirit, sensation (experience—as the *widespread* terminology of our time has it), the psychical, etc., be regarded as secondary—that is the root question which *in fact* continues to divide the philosophers into *two great camps*. The source of thousands upon thousands of mistakes and of the confusion reigning in this sphere is the fact that beneath the envelope of terms, definitions, scholastic devices and verbal artifices, these two fundamental trends are *overlooked*. (Bogdanov, for instance, refuses to acknowledge his idealism, because, you see, instead of the "metaphysical" concepts "nature" and "mind," he has taken the "experiential" physical and psychical. A word has been changed!)

The genius of Marx and Engels consisted in the very fact that in the course of a long period, *nearly half a century*, they developed materialism, that they further advanced one fundamental trend in philosophy, that they did not confine themselves to reiterating epistemological problems that had already been solved, but consistently applied—and showed *how* to apply—*this same* materialism in the sphere of the social sciences, mercilessly brushing aside as litter and rubbish the pretentious rigmarole, the innumerable attempts to "discover" a "new" line in philosophy, to invent a "new" trend and so forth. The verbal nature of such attempts, the scholastic play with new philosophical "isms," the clogging of the issue by pretentious devices, the inability to comprehend and clearly present the struggle between the two fundamental epistemological trends—this is what Marx and Engels persistently pursued and fought against throughout their entire activity.

We said, "nearly half a century." And, indeed, as far back as 1843, when Marx was only becoming Marx, *i.e.*, the founder of scientific socialism, the founder of *modern materialism,* which is immeasurably richer in content and incomparably more consistent than all preceding forms of materialism, even at that time Marx pointed out with amazing clarity the basic trends in philosophy. Karl Grün quotes a letter from Marx to Feuerbach dated October 20, 1843, in which Marx invites Feuerbach to write an article for the *Deutsch-Französische Jahrbücher* against Schelling. This Schelling, writes Marx, is a shallow braggart with his claims to having embraced and transcended all previous philosophical trends. "To the French romanticists and mystics he [Schelling] says: I am the union of philosophy and theology; to the French materialists: I am the union of the flesh and the idea; to the French sceptics: I am the destroyer of dogmatism."[1] That the "sceptics," be they called Humeans or Kantians (or, in the twentieth century, Machians), cry out against the "dogmatism" of both materialism and idealism, Marx at that time already realised; and, without letting himself be diverted by any one of a thousand wretched little philosophical systems, he was able with the help of Feuerbach to take the direct materialist road as against idealism. Thirty years later, in the afterword to the second edition of the first volume of *Capital*, Marx just as clearly and definitely contrasted *his materialism* to Hegel's *idealism,* the most consistent and developed idealism of all; he contemptuously brushed Comtian "positivism" aside and dubbed as wretched epigoni the contemporary philosophers who imagined that they had destroyed Hegel when in reality they had reverted to a repetition of the pre-Hegelian errors of Kant and Hume. In the letter to Kugelmann of June 27, 1870, Marx refers contemptuously to "Büchner, Lange, Dühring, Fechner, etc.," because they understood nothing of Hegel's dialectics and treated him with scorn.[1] And finally, take the various philosophical utterances by Marx in *Capital* and other works, and you will find an *invariable* basic motif, *viz.*, insistence upon *materialism* and contemptuous derision of all obscurity, of all confusion and all deviations towards *idealism. All* Marx's philosophical utterances revolve within these fundamental opposites, and, in the eyes of professorial philosophy, their defect lies in this "narrowness" and "one-sidedness." As a matter of fact, this refusal to recognise the hybrid projects for reconciling materialism and idealism constitutes the great merit of Marx, who moved *forward* along a sharply-defined philosophical road.

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[1] Karl Grün, *Ludwig Feuerbach in seinem Briefwechsel und Nachlass, sowie in seiner philosophischen Charakterentwicklung,* Bd. I, Leipzig 1874, S. 361.

Entirely in the spirit of Marx, and in close collaboration with him, Engels in all his philosophical works briefly and clearly contrasts the materialist and idealist line in regard to *all* questions, without, either in 1878, 1888, or 1892, taking seriously the endless attempts to "transcend" the "one-sidedness" of materialism and idealism, to proclaim a *new* trend—

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[1] Of the positivist, Beesly, Marx, in the letter (to Kugelmann—*Trans.*) of December 13, 1870, speaks as follows: "Professor Beesly is a Comtist and is as such obliged to support all sorts of crotchets." Compare this with the opinion given of the positivists of the Huxley type by Engels in 1892 (in *Socialism: Utopian and Scientific.—Trans.*).

"positivism," "realism," or some other professorial charlatanism. Engels based his *whole* fight against Dühring on the demand for consistent adherence to materialism, accusing the materialist Dühring of verbally confusing the issue, of phrasemongering, of methods of reasoning which involved a compromise with idealism and adoption of the position of idealism. Either materialism consistent to the end, or the falsehood and confusion of philosophical idealism—such is the formulation of the question given in *every paragraph* of *Anti-Dühring;* and only people whose minds had already been corrupted by reactionary professorial philosophy could fail to notice it. And right down to 1894, when the last preface was written to *Anti-Dühring,* revised and enlarged by the author for the last time, Engels continued to follow the latest developments both in philosophy and science, and continued with all his former resoluteness to hold to his lucid and firm position, brushing away the litter of new systems, big and little.

That Engels followed the new developments in philosophy is evident from *Ludwig Feuerbach.* In the 1888 preface, mention is even made of such a phenomenon as the rebirth of classical German philosophy in England and Scandinavia, whereas Engels (both in the preface and in the text of the book) has nothing but contempt for the prevailing Neo-Kantianism and Humism. It is quite obvious that Engels, observing the repetition by *fashionable* German and English philosophy of the old pre-Hegelian errors of Kantianism and Humism, was prepared to expect some good even *from the turn to Hegel* (in England and Scandinavia), hoping that the great idealist and dialectician would help to disclose petty idealist and metaphysical errors.

Without undertaking an examination of the vast number of shades of Neo-Kantianism in Germany and of Humism in England, Engels *from the very outset* refutes their fundamental deviation from materialism. Engels declares that the *entire tendency* of these two schools is *"scientifically a step backward."* And what is his opinion of the undoubtedly "positivist," according to the current terminology, the undoubtedly "realist" tendencies of these Neo-Kantians and Humeans, among whose number, for instance, he could not help knowing Huxley? That "positivism" and that "realism" which attracted, and which continue to attract, an infinite number of muddleheads, Engels declared to be *at best a philistine method of smuggling in materialism* while criticising and abjuring it publicly! One has to reflect only very little on *such* an appraisal of Thomas Huxley—a very great scientist and an incomparably more realistic realist and positive positivist than Mach, Avenarius and Co.—in order to understand how contemptuously Engels would have greeted the present infatuation of a group of Marxists with "recent positivism," the "latest realism," etc.

Marx and Engels were partisans in philosophy from start to finish; they were able to detect the deviations from materialism and concessions to idealism and fideism in each and every "new" tendency. They therefore appraised Huxley *exclusively* from the standpoint of his materialist consistency. They therefore rebuked Feuerbach for not pursuing materialism to the end, for renouncing materialism because of the errors of individual materialists, for combating religion in order to renovate it or invent a new religion, for being unable, in sociology, to rid himself of idealist phraseology and become a materialist.

And whatever particular mistakes he committed in his exposition of dialectical materialism, J. Dietzgen fully appreciated and took over this great and most precious tradition of his teachers. Dietzgen sinned much by his clumsy deviations from materialism, but he never attempted to dissociate himself from it in principle, he never attempted to hoist a "new" standard, and always at the decisive moment he firmly and categorically declared: I am a materialist; our philosophy is a materialist philosophy. "Of all parties," our Joseph Dietzgen justly said, "the middle party is the most repulsive.... Just as parties in politics are more and more becoming divided into two camps ... so science too is being divided into two general classes (*Generalklassen*): metaphysicians on the one hand, and physicists, or materialists, on the other.[1] The intermediate elements and conciliatory quacks, with their various appellations—spiritualists, sensationalists, realists, etc., etc.,—fall into the current on their way. We aim at definition and clarity. The reactionaries who sound a retreat call themselves idealists,[2] and materialists should be the name for all who are striving to liberate the human mind from the metaphysical spell.... If we compare the two parties respectively to solid and liquid, between them there is a mush."[3]

True! The "realists," etc., including the "positivists," the Machians, etc., are all a wretched mush; they are a contemptible *middle party* in philosophy, who confuse the materialist and idealist trends on every question. The attempt to escape these two basic trends in philosophy is nothing but "conciliatory quackery."

J. Dietzgen had not the slightest doubt that the "scientific priestcraft" of idealist philosophy is simply the antechamber to open priescraft. "Scientific priestcraft" he wrote, "is seriously endeavouring to assist religious priestcraft" (*op. cit.,* p. 51). "In particular, the sphere of epistemology, the misunderstanding of the human mind, is such a louse-hole" *(Lausgrube)* in which both kinds of priests "lay their eggs." "Graduated flunkeys," who with their talk of "ideal blessings" stultify the people by their sham *(geschraubte)* "idealism" (p. 53)—that is J. Dietzgen's opinion of the professors of philosophy. "Just as the antipodes of the good God is the devil, so the professorial priest *(Kathederpfaffen)* has his opposite pole in the materialist." The materialist theory of knowledge is "a universal weapon against religious belief" (p. 55), and not only against the "notorious, formal and common religion of the priests, but also against the most refined, elevated professorial religion of muddled *(benebelter)* idealists" (p. 58).

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[1] Here again we have a clumsy and inexact expression: instead of "metaphysicians," he should have said "idealists." Elsewhere Dietzgen himself contrasts the metaphysicians and the dialecticians.

[2] Note that Dietzgen has corrected himself and now explains *more precisely* which is the party of the enemies of materialism.

[3] See the article, "Social-Democratic Philosophy," written in 1876, *Kleinere philosophische Schriften,* 1903, S. 135.

Dietzgen was ready to prefer "religious honesty" to the "half-heartedness" of freethinking professors (p. 60), for "there at least there is a system," there we find complete people, people who do not separate theory from practice. For the Herr Professors "philosophy is not a science, but a means of defence against Social-Democracy..." (p. 107). "All who call themselves philosophers, professors, and university lecturers are, despite apparent freethinking, more or less immersed in superstition and mysticism ... and in relation to Social-Democracy constitute a single ... reactionary mass" (p. 108). "Now, in order to follow the true path, without being led astray by all the religious and philosophical gibberish *(Welsch)*, it is necessary to study the falsest of all false paths *(der Holzweg der Holzwege)*, philosophy" (p. 103).

Let us now examine Mach, Avenarius and their school from the standpoint of parties in philosophy. Oh, these gentlemen *boast* of their *non-partisanship*, and if they have an antipodes, it is the *materialist* ... and *only* the materialist. A red thread that runs through *all* the writings of *all* the Machians is the stupid claim to have "risen above" materialism and idealism, to have transcended this "obsolete" antithesis; but *in fact* the whole fraternity are *continually* sliding into idealism and are conducting a steady and incessant struggle against materialism. The subtle epistemological crotchets of a man like Avenarius are but professorial inventions, an attempt to form a small philosophical sect "of his own"; but, *as a matter of fact*, in the general circumstances of the struggle of ideas and trends in modern society, the *objective* part played by these epistemological artifices is in every case the same, namely, to clear the way for idealism and fideism, and to serve them faithfully. In fact, it cannot be an accident that the small school of empirio-criticists is acclaimed by the English spiritualists, like Ward, by the French neo-criticists, who praise Mach for his attack on materialism, and by the German immanentists! Dietzgen's expression, "graduated flunkeys of fideism," hits the nail on the head in the case of Mach, Avenarius and their whole school.[1]

It is the misfortune of the Russian Machians, who undertook to "reconcile" Machism and Marxism, that they trusted the reactionary professors of philosophy and as a result slipped down an inclined plane. The methods of operation employed in the various attempts to develop and supplement Marx were not very ingenious. They read Ostwald, believe Ostwald, paraphrase Ostwald and call it Marxism. They read Mach, believe Mach, paraphrase Mach and call it Marxism. They read Poincaré, believe Poincaré, paraphrase Poincaré and call it Marxism! *Not a single one* of these professors, who are capable of making very valuable contributions in the special fields of chemistry, history, or physics, *can be trusted one iota* when it comes to philosophy. Why? For the same reason that *not a single* professor of political economy, who may be capable of very valuable contributions in the field of factual and specialised investigations, can be trusted *one*

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[1] Here is another example of how the widespread currents of reactionary bourgeois philosophy make use of Machism in practice. Perhaps the "latest fashion" in the latest American philosophy is "pragmatism" (from the Greek word "pragma"—action; that is, a philosophy of action). The philosophical journals perhaps speak more of pragmatism than of anything else. Pragmatism ridicules the metaphysics both of idealism and materialism, acclaims experience and only experience, recognises practice as the only criterion, refers to the positivist movement in general, *especially turns for support to Ostwald, Mach, Pearson, Poincaré* and *Duhem* for the belief that science is not an "absolute copy of reality" and ... successfully deduces from all this a God for practical purposes, and only for practical purposes, without any metaphysics, and without transcending the bounds of experience (*cf.* William James, *Pragmatism, A New Name for Some Old Ways of Thinking,* New York, 1907, pp. 57 and 106 especially). From the standpoint of materialism the difference between Machism and pragmatism is as insignificant and unimportant as the difference between empirio-criticism and empirio-monism. Compare, for example, Bogdanov's definition of truth with the pragmatist definition of truth, which is: "Truth for a pragmatist becomes a class-name for all sorts of definite working values in experience" (*ibid.,* p. 68).

iota when it comes to the general theory of political economy. For in modern society the latter is as much a *partisan* science as is *epistemology*. Taken as a whole, the professors of economics are nothing but learned salesmen of the capitalist class, while the professors of philosophy are learned salesmen of the theologians.

The task of Marxists in both cases is to be able to master and adapt the achievements of these "salesmen" (for instance, you will not make the slightest progress in the investigation of new economic phenomena unless you have recourse to the works of these salesmen) and *to be able* to lop off their reactionary tendency, to pursue one's *own* line and to combat the *whole alignment* of forces and classes hostile to us. And this is just what our Machians were unable to do; they *slavishly* followed the lead of the reactionary professorial philosophy. "Perhaps we have gone astray, but we are seeking," wrote Lunacharsky in the name of the authors of the *Studies*. The trouble is that it is not *you* who are seeking, but you who are *being sought*! You do not go with your, *i.e.*, Marxist (for you want to be Marxists) standpoint to every change in the bourgeois philosophical fashion; the fashion comes to you, foists upon you its new surrogates got up in the idealist taste, one day à la Ostwald, the next day à la Mach, and the day after à la Poincaré. These silly "theoretical" devices ("energetics," "elements," "introjections," etc.) in which you so naïvely believe are confined to a narrow and tiny school, while the ideological and *social tendency* of these devices is immediately spotted by the Wards, the neo-criticists, the immanentists, the Lopatins and the pragmatists, and *it serves their purposes*. The infatuation for empirio-criticism and "physical" idealism passes as rapidly as the infatuation for Neo-Kantianism and "physiological" idealism; but fideism takes its toll from every such infatuation and modifies its devices in a thousand ways for the benefit of philosophical idealism.

The attitude towards religion and the attitude towards natural science excellently illustrate the *actual* class use made of empirio-criticism by bourgeois reactionaries.

Take the first question. Do you think it is an accident that in a collective work directed *against* the philosophy of Marxism Lunacharsky went so far as to speak of the "deification of the higher human potentialities," of "religious atheism," etc.?[1] If you do, it is only because the Russian Machians have not informed the public correctly regarding the *whole* Machian current in Europe and the relation of this current to religion. Not only is this relation in no way similar to the relation of Marx, Engels, J. Dietzgen and even Feuerbach, but it is its *very opposite,* beginning with Petzoldt's statement to the effect that empirio-criticism "contradicts neither theism nor atheism" (*Einführung in die Philosophie der reinen Erfahrung,* Bd. I, S. 351), or Mach's declaration that "religious opinion is a private affair," and ending with the *explicit fideism*, the explicitly *arch-reactionary* views of Cornelius, who praises Mach and whom Mach praises, of Carus and of all the immanentists. The neutrality of a *philosopher* in this question *is in itself* servility to fideism, and Mach and Avenarius, because of the very premises of their epistemology, do not and cannot rise above neutrality.

Once you deny objective reality, given us in sensation, you have already lost every one of your weapons against fideism, for you have slipped into agnosticism or subjectivism—and that is all fideism wants. If the perceptual world is objective reality, then the door is closed to every other "reality" or quasi-reality (remember that Bazarov believed the "realism" of the immanentists, who declare God to be a "real concept"). If the world is matter in motion, matter can and must be infinitely studied in the infinitely complex and detailed manifestations and ramifications of *this* motion, the motion of *this* matter; but beyond it, beyond the "physical," external world, with which everyone is familiar, there can be nothing. And the hostility to materialism and the showers of abuse heaped on the materialists are all in the order of things in civilised and democratic Europe. All this is going on to this day. All this is being *concealed* from the public by the Russian Machians, who have *not once* attempted even simply to compare the attacks made on materialism by Mach, Avenarius, Petzoldt and Co., with the statements made *in favour of* materialism by Feuerbach, Marx, Engels and J. Dietzgen.

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[1] *Studies,* pp. 157, 159. In the *Zagranichnaya Gazeta* the same author speaks of "scientific socialism in its religious significance" (No. 3, p. 5) and in *Obrazovaniye,* 1908, No. 1, p. 164, he explicitly says: "For a long time a new religion has been maturing within me. . . ."

But this "concealment" of the relation of Mach and Avenarius to fideism will not avail. The facts speak for themselves. No efforts can release these reactionary professors from the pillory in which they have been placed by the kisses of Ward, the neo-criticists, Schuppe, Schubert-Soldern, Leclair, the pragmatists, etc. And the influence of the persons mentioned, as philosophers and professors, the popularity of their ideas among the "cultured," *i.e.,* the bourgeois, public and the specific literature they have created are ten times wider and richer than the particular little school of Mach and Avenarius. The little school serves those it should serve, and it is exploited as it deserves to be exploited.

The shameful things to which Lunacharsky has stooped are not exceptional; they are the product of empirio-criticism, both Russian and German. They cannot be defended on the grounds of the "good intentions" of the author, or the "special meaning" of his words; if it were the direct and common, *i.e.,* the directly fideistic meaning, we should not stop to discuss matters with the author, for most likely not a single Marxist could be found in whose eyes such statements would *not* have placed Anatole Lunacharsky *exactly* in the same category as Peter Struve. If this is not the case (and it is not the case *yet*), it is exclusively because we perceive the "special" meaning and are *fighting while there is still ground* for a fight on comradely lines. This is just the disgrace of Lunacharsky's statements—that he *could* connect them with his "good" intentions. This is just the evil of his "theory"—that it permits the use of *such* methods or of *such* conclusions in the pursuit of good intentions. This is just the trouble—that *at best* "good" intentions are the subjective affair of Tom, Dick or Harry, while the *social significance* of such statements is undeniable and indisputable, and no reservation or explanation can weaken their effect.

One must be blind not to see the ideological affinity between Lunacharsky's "deification of the higher human potentialities" and Bogdanov's "general substitution" of the psychical for all physical nature. This is one and the same thought; in the one case it is expressed principally from the æsthetic standpoint, and in the other from the epistemological standpoint. "Substitution," approaching the subject *tacitly* and from a different angle, *already deifies* the "higher human potentialities," by divorcing the "psychical" from man and by substituting an immensely extended, abstract, divinely-lifeless "psychical in general" *for all physical nature.* And what of Yushkevich's "Logos" introduced into the "irrational stream of experience"?

A single claw ensnared, and the bird is lost. And our Machians have all become ensnared in idealism, that is, in a diluted and subtle fideism; they became ensnared from the moment they took "sensation" not as the image of the external world but as a special "element." It is nobody's sensation, nobody's mind, nobody's spirit, nobody's will—this is what one inevitably comes to if one does not recognise the materialist theory that the human mind *reflects* an objectively real external world.

5. ERNST HAECKEL AND ERNST MACH

Let us now examine the attitude of Machism, as a *philosophical current*, towards the natural sciences. All Machism, from beginning to end, *combats* the "metaphysics" of the natural sciences, this being the name they give to *natural-scientific materialism, i.e.*, to the instinctive, unwitting, unformed, philosophically-unconscious conviction shared by the overwhelming majority of scientists regarding the objective reality of the external world reflected by our consciousness. And our Machians maintain a skulking silence on this *fact* and obscure or confuse the *inseparable* connection between the instinctive materialism of the scientists and *philosophical materialism* as a trend, a trend known long ago and hundreds of times affirmed by Marx and Engels.

Take Avenarius. In his very first work, *Philosophie als Denken der Welt gemäß dem Prinzip des kleinsten Kraftmaßes,* published in 1876, he attacked the metaphysics of the natural sciences,[1] *i.e.,* natural-scientific materialism, and, as he himself admitted in 1891 (without, however, "correcting" his views!), attacked it from the standpoint of epistemological idealism.

Take Mach. From 1872 (or even earlier) down to 1906 he waged continuous war on the metaphysics of natural science. However, he was conscientious enough to admit that his views were shared by "a number of philosophers" (the immanentists included), but by "*very few* scientists" (*Analyse der Empfindungen,* S. xi). In 1906 Mach also honestly admitted that the "majority of scientists adhere to materialism" (*Erkenntnis und Irrtum,* 2. Aufl., S. 4).

Take Petzoldt. In 1900 he proclaimed that the "natural sciences are thoroughly *(ganz und gar)* imbued with metaphysics." "Their 'experience' has still to be purified" (*Einführung in die Philosophie der reinen Erfahrung,* Bd. I, S. 343). We know that Avenarius and Petzoldt "purify" experience of all recognition of the objective reality given us in sensation. In 1904 Petzoldt declared: "The mechanical world outlook of the modern scientist is essentially no better than that of the ancient Indians. . . . It makes no difference whether the world rests on a mythical elephant or on just as mythical a swarm of molecules and atoms epistemologically thought of as real and therefore not used merely metaphorically *(bloss bildlich)*" (Bd. II, S. 176).

Take Willy, the only Machian decent enough to be ashamed of his kinship with the immanentists. Yet, in 1905 he too declared: ". . . The natural sciences, after all, are also in many respects an authority of which we must rid ourselves" (*Gegen die Schulweisheit,* S. 158).

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[1] §§ 79, 114, etc.

But this is all *sheer obscurantism,* out-and-out reaction. To regard atoms, molecules, electrons, etc., as an approximately true reflection in our mind of the *objectively real movement of matter* is equivalent to believing in an elephant upon which the world rests! No wonder that this *obscurantism,* decked in the cap and bells of fashionable positivism, was greeted by the immanentists *with open arms.* There is *not a single* immanentist who would not furiously attack the "metaphysics" of science, the "materialism" of the scientists, *precisely because of the recognition* by the scientists of the objective reality of matter (and its particles), time, space, laws of nature, etc., etc. Long before the new discoveries in physics which gave rise to "physical idealism" were made, Leclair, using Mach as a support, combated "The Predominant Materialist Trend *(Grundzug)* of Modern Science" (the title of § 6 of *Der Realismus usw.,* 1879). Schubert-Soldern fought "The Metaphysics of Natural Science" (the title of Chapter II of *Grundlagen einer Erkenntnistheorie,* 1884). Rehmke battled with natural-scientific "materialism," that *"metaphysics of the street"* (*Philosophie und Kantianismus,* 1882, S. 17), etc., etc.

And the immanentists quite legitimately drew *direct and outspoken* fideist conclusions from this *Machian* idea of the "metaphysical character" of natural-scientific materialism. If natural science in its theories depicts not objective reality, but *only* metaphors, symbols, forms of human experience, etc., it is beyond dispute that humanity is entitled to create for itself in another sphere a *no less "real* concept," such as God, and so forth.

The philosophy of the scientist Mach is to science what the kiss of the Christian Judas was to Christ. Mach likewise betrays science into the hands of fideism by virtually deserting to the camp of philosophical idealism. Mach's renunciation of natural-scientific materialism is a reactionary phenomenon in every respect. We saw this quite clearly when we spoke of the struggle of the "physical idealists" against the *majority* of scientists, who continue to maintain the standpoint of the old philosophy. We shall see it still more clearly if we compare the eminent scientist, Ernst Haeckel, with the eminent (among the reactionary philistines) philosopher. Ernst Mach.

The storm provoked by Ernst Haeckel's *The Riddle of the Universe* in every civilised country strikingly brought out, on the one hand, the *partisan character* of philosophy in modern society and, on the other, the true social significance of the struggle of materialism against idealism and agnosticism. The fact that the book was sold in *hundreds of thousands* of copies, that it was immediately translated into all languages and that it appeared in specially cheap editions, clearly demonstrates that the book "has found its way to the masses," that there are numbers of readers whom Ernst Haeckel at once won over to his side. This popular little book became a weapon in the class struggle. The professors of philosophy and theology in every country of the world set about denouncing and annihilating Haeckel in every possible way. The eminent English physicist Lodge hastened to defend God against Haeckel. The Russian physicist Mr. Chwolson went to Germany to publish a vile reactionary pamphlet attacking Haeckel and to assure the respectable philistines that not all scientists now hold the position of "naïve realism."[1] There is no counting the theologians who joined the campaign against Haeckel. There was no abuse not showered on him by the official professors of philosophy.[2] It was amusing to see how—perhaps for the first time in their lives—the eyes of these mummies, dried and shrunken in the atmosphere of lifeless scholasticism, began to gleam and their cheeks to glow under the slaps which Haeckel administered them. The high-priests of pure science, and, it would appear, of the most abstract theory, fairly groaned with rage. And throughout all the howling of the philosophical diehards (the idealist Paulsen, the immanentist Rehmke, the Kantian Adickes, and the others, whose name, god wot, is legion) one underlying motif is clearly discernible: they are all directed against the *"metaphysics"* of science, against "dogmatism," against "the exaggeration of the value and significance of science," against "natural-scientific *materialism.*" He is a materialist—at him! at the materialist! He is deceiving the public by not calling himself a materialist directly!—that is what particularly incenses the worthy professors.

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[1] O. D. Chwolson, *Hegel, Haeckel, Kossouth und das zwölfte Gebot*, 1906, *cf*. S. 80.

[2] The pamphlet of Heinrich Schmidt, *Der Kampf um die Welträtsel* (Bonn, 1900), gives a fairly good picture of the campaign launched against Haeckel by the professors of philosophy and theology. But this pamphlet is already very much out-of-date.

And the noteworthy thing in all this tragi-comedy[1] is the fact that Haeckel himself *renounces materialism* and rejects the appellation. What is more, far from rejecting religion altogether, he has invented his own religion (something like Bulgakov's "atheistic faith" or Lunacharsky's "religious atheism"), and on grounds of *principle* advocates a union of religion and science. What then is it all about? What "fatal misunderstanding" started the row?

The point is that Haeckel's philosophical naïveté, his lack of definite partisan aims, his anxiety to respect the prevailing philistine prejudice against materialism, his personal conciliatory tendencies and proposals concerning religion, all this gave the greater salience to *the general spirit* of his book, the *ineradicability* of natural-scientific materialism and its *irreconcilability* with *all* official professorial philosophy and theology. Haeckel personally does not seek a rupture with the philistines, but what he expounds with such unshakeably naïve conviction is *absolutely* incompatible with any of the shades of prevailing philosophical idealism. All these shades, from the crudest reactionary theories of a Hartmann, to Petzoldt, who fancies himself the latest, most progressive and advanced of the positivists, and the empirio-criticist Mach—*all* are agreed that natural-scientific materialism is "metaphysics," that the recognition of an objective reality underlying the theories and conclusions of science is sheer "naïve realism," etc. And for this doctrine, "sacred" to *all* official philosophy and theology, every page of Haeckel is a *slap in the face.* This scientist, who undoubtedly expressed the very firmly implanted, although unformed opinions, sentiments and tendencies of the overwhelming majority of the scientists of the end of the nineteenth century and the beginning of the twentieth century, instantly, easily and simply revealed what professorial philosophy tried to conceal from the people and from itself, namely, the fact that there is a foundation, growing ever wider and firmer, which shatters all the efforts and strivings of the thousand and one little schools of philosophical idealism, positivism, realism, empirio-criticism and other confusionism. This foundation is *natural-scientific materialism.* The conviction of the "naïve realists" (in other words, of all humanity) that our sensations are images of an objectively real external world is the conviction of the mass of scientists, one that is steadily growing and gaining in strength.

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[1] The tragic element was introduced by the attempt made on Haeckel's life this spring (1908). After Haeckel had received a number of anonymous letters addressing him by such epithets as "dog," "atheist," "monkey," and so forth, some true German soul threw a stone of no mean size through the window of Haeckel's study in Jena.

The cause of the founders of new philosophical schools and of the inventors of new epistemological "isms" is lost, irrevocably and hopelessly. They may flounder about in their "original" petty systems; they may strive to engage the attention of a few admirers in the interesting controversy as to who was the first to exclaim, "Eh!"—the empirio-critical Bobchinsky, or the empirio-monistic Dobchinsky;[1] they may even devote themselves to creating an extensive "special" literature, like the "immanentists." But the course of development of science, despite its vacillations and hesitations, despite the unwitting character of the materialism of the scientists, despite yesterday's infatuation with fashionable "physiological idealism" or today's infatuation with fashionable "physical idealism," is sweeping aside all the petty systems and artifices and once again bringing to the forefront the "metaphysics" of *natural-scientific materialism.*

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[1] Characters in Gogol's *The Inspector General.—Trans.*

Here is an illustration of this from Haeckel. In his *The Wonders of Life,* Haeckel compares the monistic and dualistic theories of knowledge. We give the most interesting points of the comparison:[1]

The Monistic Theory of Knowledge	The Dualistic Theory of Knowledge
. . . .	. . . .
3. Cognition is a physiological process, whose anatomical organ is the brain.	3. Cognition is not a physiological but a purely spiritual process.
4. The only part of the human brain in which knowledge is engendered is a spatially limited sphere of the cortex, the phronema.	4. The part of the human brain which appears to function as the organ of knowledge is in fact only the instrument that permits the spiritual process to manifest itself.
. . . .	. . . .
5. The phronema is a highly perfected dynamo, the individual parts of which, the phroneta, consist of millions of cells (phronetal cells). Just as in the case of every other organ of the body, so in the case of this mental organ, its function, the "mind," is the sum-total of the functions of its constituent cells.	5. The phronema as the *organ* of reason is not autonomous, but, through its constituent parts (phroneta) and the cells that compose them, serves only as intermediary between the non-material mind and the external world. Human reason differs absolutely from the mind of the higher animals and from the instinct of the lower animals.

This typical quotation from his works shows that Haeckel does not attempt an analysis of philosophical problems and is not able to contrast the materialist theory of knowledge with the idealist theory of knowledge. He *ridicules all* idealist philosophies—more broadly, all peculiarly philosophical artifices—from the standpoint of natural science, *without even permitting the idea* that any other theory of knowledge but *natural-scientific materialism* is possible. He ridicules the philosophers from the standpoint of a materialist, *without himself realising* that his standpoint is that of a materialist!

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[1] I use the French translation, *Les Merveilles de la Vie,* Paris, Schleicher, Tables I et XVI.

The impotent wrath aroused in the philosophers by this almighty materialism is comprehensible. We quoted above the opinion of the "true Russian" Lopatin. And here is the opinion of Mr. Rudolph Willy, the most progressive of the "empirio-criticists," who is irreconcilably hostile to idealism (don't laugh!). "Haeckel's monism is a very heterogeneous mixture: it unites certain natural-scientific laws, such as the law of the conservation of energy ... with certain scholastic traditions about substance and the thing-in-itself into a chaotic jumble" (*Gegen die Schulweisheit,* S. 128).

What has annoyed this most worthy "recent positivist"? Well, how could he help being annoyed when he immediately realised that from Haeckel's standpoint all the great doctrines of his teacher Avenarius—for instance, that the brain is not the organ of thought, that sensations are not images of the external world, that matter ("substance") or "the thing-in-itself" is not an objective reality, and so forth—are nothing but *sheer idealist gibberish!?* Haeckel did not say it in so many words because he did not concern himself with philosophy and was not acquainted with "empirio-criticism" *as such.* But Rudolph Willy could not help realising that a hundred thousand Haeckel readers meant as many people spitting in the face of the *philosophy* of Mach and Avenarius. Willy wipes his face in advance, *in the Lopatin manner.* For the *essence* of the arguments which Mr. Lopatin and Mr. Willy marshal against materialism in general and natural-scientific materialism in particular, is exactly the same in both. To us Marxists the difference between Mr. Lopatin and Messrs. Willy, Petzoldt, Mach and Co. is no greater than the difference between the Protestant theologians and the Catholic theologians.

The "war" on Haeckel *has proven* that this view of ours corresponds to *objective reality, i.e.,* to the class nature of modern society and its class ideological tendencies.

Here is another little example. The Machian Kleinpeter has translated from English into German, under the title of *Das Weltbild der modernen Naturwissenschaft* (Leipzig 1905), a work by Carl Snyder well known in America. This work gives a clear and popular account of a number of recent discoveries in physics and other branches of science. And the Machian Kleinpeter felt himself called upon to supply the book with a preface in which he makes certain *reservations,* such as, for example, that Snyder's epistemology is "not satisfactory" (p. v). Why so? Because Snyder never entertains the slightest doubt that the world picture is a picture of how matter moves and of how *"matter thinks"* (p. 228). In his next book, *The World Machine* (London, 1907), Snyder, referring to the fact that his book is dedicated to the memory of Democritus of Abdera, who lived about 460-360 B.C., says: "Democritus has often been styled the grandsire of materialism. It is a school of philosophy that is a little out of fashion nowadays; yet it is worthy of note that practically all of the modern advance in our ideas of this world has been grounded upon his conceptions. Practically speaking, materialistic assumptions are simply *unescapable* in physical investigations" (p. 140).

"...If he like, he may dream with good Bishop Berkeley that it is all a dream. Yet comforting as may be the legerdemain of an idealised idealism, there are still few among us who, whatever they may think regarding the problem of the external world, doubt that they themselves exist; and it needs no long pursuit of the will-o'-the-wisps of the *Ich* and *non-Ich* to assure oneself that if in an unguarded moment we assume that we ourselves have a personality and a being, we let in the whole procession of appearances which come of the six gates of the senses. The nebular hypothesis, the light-bearing ether, the atomic theory, and all their like, may be but convenient 'working hypotheses,' but it is wel. to remember that, in the absence of negative proof, they stand on more or less the same footing as the hypothesis that a being you call 'you,' Oh, Indulgent Reader, scans these lines" (pp. 31-32).

Imagine the bitter lot of a Machian when his favourite subtle constructions, which reduce the categories of science to mere working hypotheses, are laughed at by the scientists on both sides of the ocean as sheer nonsense! Is it to be wondered that Rudolph Willy, *in 1905*, combats Democritus as though he were a living enemy, thereby providing an excellent illustration of the *partisan character of philosophy* and once more exposing the real position he himself takes up in this partisan struggle? He writes: "Of course, Democritus was not conscious of the fact that atoms and the void are only fictitious concepts which perform mere accessory services *(blosse Handlangerdienste),* and maintain their existence only by grace of expediency, just as long as they prove useful. Democritus was not free enough for this; but neither are our modern natural scientists, with few exceptions. The faith of old Democritus is the faith of our scientists" (*op. cit.,* p. 57).

And there is good reason for despair! The "empirio-criticists" have proven in quite a "new way" that both space and atoms are "working hypotheses"; and yet the natural scientists deride this *Berkeleianism* and follow Haeckel. We are by no means idealists, this is a slander; we are only striving (together with the idealists) to refute the epistemological position of Democritus; we have been striving to do so for more than 2,000 years, but all in vain! And nothing better remains for our leader Ernst Mach to do than to dedicate his last work, the outcome of his life and philosophy, *Erkenntnis und Irrtum,* to *Wilhelm Schuppe* and to remark ruefully in the text that the majority of scientists are materialists and that "we also" *sympathise* with Haeckel ... for his "freethinking" (p. 14).

And there he completely betrays himself, this ideologist of reactionary philistinism who *follows* the arch-reactionary Schuppe and *"sympathises"* with Haeckel's freethinking. They are all like this, these humanitarian philistines in Europe, with their freedom-loving sympathies and their ideological (political and economic) captivity to the Wilhelm Schuppes.[1] Non-partisanship in philosophy is only wretchedly masked servility to idealism and fideism.

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[1] Plekhanov in his criticism of Machism was less concerned with refuting Mach than with dealing a factional blow at Bolshevism. For

Let us, in conclusion, compare this with the opinion of Haeckel held by Franz Mehring, who not only wants to be, but who knows how to be a Marxist. The moment *The Riddle of the Universe* appeared, towards the end of 1899, Mehring pointed out that "Haeckel's work, both in its less good and its very good aspects, is eminently adapted to help clarify the apparently rather confused views prevailing in the party as to the significance for it of *historical* materialism, on the one hand, and historical *materialism,* on the other."[1] Haeckel's defect is that he has not the slightest conception of *historical* materialism, which leads him to utter the most woeful nonsense about politics, about "monistic religion," and so on and so forth. "He (Haeckel) is a materialist and monist, not a *historical* but a natural-scientific materialist" *(ibid.).*

"He who wants to perceive this inability [of natural-scientific materialism to deal with social problems] tangibly, he who wants to be convinced that natural-scientific materialism must be broadened into historical materialism if it truly desires to become an invincible weapon in the great struggle for the liberation of mankind, let him read Haeckel's book.

"But let him not read it for this purpose alone! Its uncommonly weak side is inseparably bound up with its uncommonly strong side, *viz.,* with the comprehensible and luminous description (which after all takes up by far the greater and more important part of the book) given by Haeckel of the development of the natural sciences in this [the 19th] century, or, in other words, of the *triumphant march of natural-scientific materialism.*"[2]

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this petty and miserable exploitation of fundamental theoretical differences, he has been already deservedly punished—with two books by Machian Mensheviks.

[1] Franz Mehring, *"Die Welträtsel," Neue Zeit,* 1899-1900 Bd. XVIII, 1, S. 418.

[2] *Ibid.*, p. 419.

CONCLUSION

There are four standpoints from which a Marxist must proceed to form a judgment of empirio-criticism.

First and foremost, the theoretical foundations of this philosophy must be compared with those of dialectical materialism. Such a comparison, to which the first three chapters were devoted, reveals, *along the whole line* of epistemological problems, the *thoroughly reactionary* character of empirio-criticism, which uses new artifices, terms and subtleties to disguise the old errors of *idealism and agnosticism.* Only utter ignorance of the nature of philosophical materialism generally and of the nature of Marx's and Engels' dialectical method can lead one to speak of a "union" of empirio-criticism and Marxism.

Secondly, the place of empirio-criticism, as one very small school of specialists in philosophy, in relation to the other modern schools of philosophy must be determined. Both Mach and Avenarius started with Kant and, leaving him, proceeded not towards materialism, but in the opposite direction, towards Hume and Berkeley. Imagining that he was "purifying experience" generally, Avenarius was in fact only purifying agnosticism of Kantianism. The whole school of Mach and Avenarius is more and more definitely moving towards idealism, hand in hand with one of the most reactionary of the idealist schools, *viz.*, the so-called immanentists.

Thirdly, the indubitable connection between Machism and one school in one branch of modern science must be borne in mind. The vast majority of scientists, both generally and in this special branch of science in question, *viz.*, physics, are invariably on the side of materialism. A minority of new physicists, however, influenced by the breakdown of old theories brought about by the great discoveries of recent years, influenced by the crisis in the new physics, which has very clearly revealed the relativity of our knowledge, have, owing to their ignorance of dialectics, slipped into idealism by way of relativism. The physical idealism in vogue today is as reactionary and transitory an infatuation as the fashionable physiological idealism of the recent past.

Fourthly, behind the epistemological scholasticism of empirio-criticism it is impossible not to see the struggle of parties in philosophy, a struggle which in the last analysis reflects the tendencies and ideology of the antagonistic classes in modern society. Recent philosophy is as partisan as was philosophy two thousand years ago. The contending parties are essentially, although it is concealed by a pseudo-erudite quackery of new terms or by a feeble-minded non-partisanship, materialism and idealism. The latter is merely a subtle, refined form of fideism, which stands fully armed, commands vast organisations and steadily continues to exercise influence on the masses, turning the slightest vacillation in philosophical thought to its own advantage. The objective, class role played by empirio-criticism entirely consists in rendering faithful service to the fideists in their struggle against materialism in general and historical materialism in particular.

SUPPLEMENT TO CHAPTER FOUR, SECTION I

FROM WHAT ANGLE DID N. G. CHERNYSHEVSKY CRITICISE KANTIANISM?

In the first section of Chapter IV we showed in detail that the materialists have been criticising Kant from a standpoint diametrically opposite to that from which Mach and Avenarius criticise him. It would not be superfluous to add here, albeit briefly, an indication of the epistemological position held by the great Russian Hegelian and materialist, N. G. Chernyshevsky.

Shortly after Albrecht Rau, the German disciple of Feuerbach, had published his criticism of Kant, the great Russian writer N. G. Chernyshevsky, who was also a disciple of Feuerbach, first attempted an explicit statement of his attitude towards both Feuerbach and Kant. N. G. Chernyshevsky had appeared in Russian literature as a follower of Feuerbach as early as the 'fifties, but our censorship did not allow him even to mention Feuerbach's name. In 1888, in the preface to the projected third edition of his *The Æsthetic Attitude of Art to Reality*, N. G. Chernyshevsky attempted to allude directly to Feuerbach, but in 1888 too the censor refused to allow even a mere reference to Feuerbach! It was not until 1906 that the preface saw the light (see N. G. Chernyshevsky, *Collected Works*, Vol. X, Part II, pp. 190-97). In this preface N. G. Chernyshevsky devotes half a page to criticising Kant and the scientists who follow Kant in their philosophical conclusions.

Here is the excellent argument given by Chernyshevsky in 1888:

"Natural scientists who imagine themselves to be builders of all-embracing theories are really disciples, and usually poor disciples, of the ancient thinkers who evolved the metaphysical systems, usually thinkers whose systems had already been partially destroyed by Schelling and finally destroyed by Hegel. One need only point out that the majority of the natural scientists who endeavour to construct broad theories of the laws of operation of human thought only repeat Kant's metaphysical theory regarding the subjectivity of our knowledge. . . ." (For the benefit of the Russian Machians who manage to muddle everything, let us say that Chernyshevsky is below Engels in so far as in his terminology he confuses the opposition between materialism and idealism with the opposition between metaphysical thought and dialectical thought; but Chernyshevsky is entirely on Engels' level in so far as he takes Kant to task not for realism, but for agnosticism and subjectivism, not for recognition of the "thing-in-itself," but for inability to derive our knowledge from this objective source.) ". . . they argue from Kant's words that the forms of our sense-perception have no resemblance to the forms of the actual existence of objects. . . ." (For the benefit of the Russian Machians who manage to muddle everything, let us say that Chernyshevsky's criticism of Kant is the diametrical opposite of the criticism of Kant by Avenarius, Mach and the immanentists, because for Chernyshevsky, as for every materialist, the forms of our sense-perception do resemble the form of the actual—*i.e.*, objectively-real—existence of objects.) ". . . that, therefore, really existing objects, their real qualities, and the real relations between them are unknowable to us. . . ." (For the benefit of the Russian Machians who manage to muddle everything, let us say that for Chernyshevsky, as for every materialist, objects, or to use Kant's ornate language, "things-in-themselves," *really* exist and are *fully* knowable to us, knowable in their existence, their qualities and the real relations between them.) ". . . and if they were knowable they could not be the object of our thought, which shapes all the material of knowledge into forms totally different from the forms of actual existence, that, moreover, the very laws of thought have only a subjective significance. . . ." (For the benefit of the Machian muddlers, let us say that for Chernyshevsky, as for every materialist, the laws of thought have not merely a subjective significance; in other words, the laws of thought reflect the forms of actual existence of objects, fully resemble, and do not differ from, these forms.) "... that in reality there is nothing corresponding to what appears to us to be the connection of cause and effect, for there is neither antecedent nor subsequent, neither whole nor parts, and so on and so forth...." (For the benefit of the Machian muddlers, let us say that for Chernyshevsky, as for every materialist, there does exist in reality what appears to us to be the connection between cause and effect, there is objective causality or natural necessity.) "... When natural scientists stop uttering such and similar metaphysical nonsense, they will be capable of working out, and probably are already working out, on the basis of science, a system of concepts more exact and complete than those propounded by Feuerbach...." (For the benefit of the Machian muddlers, let us say that Chernyshevsky regards as metaphysical nonsense *all* deviations from materialism, both in the direction of idealism and in the direction of agnosticism.) "... But meanwhile, the best statement of the scientific concepts of the so-called fundamental problems of man's inquisitiveness remains that made by Feuerbach" (pp. 195-96). By the fundamental problems of man's inquisitiveness Chernyshevsky means what in modern language are known as the fundamental problems of the theory of knowledge, or epistemology. Chernyshevsky is the only really great Russian writer, from the 'fifties until 1888 who was able to keep on the level of an integral philosophical materialism and who spurned the wretched nonsense of the Neo-Kantians, positivists, Machians and other muddleheads. But Chernyshevsky did not succeed in rising, or, rather, owing to the backwardness of Russian life, was unable to rise to the level of the dialectical materialism of Marx and Engels.

APPENDIX

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